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ABSTRACT

A study analyzed how the oil industry in Cameroon developed and influenced the expansion, structure, and content of Cameroon's formal and nonformal education and training system. A survey of 213 employees and 8 enterprises was supplemented by a review of government reports and official published and unpublished documents. The economy of Cameroon was examined, with special reference to technological policy, industrial development, and research and development (R&D) activities. The importance of oil was demonstrated in terms of its export earnings, contribution to revenue, and impact on employment. The industry's structure, activities, growth of production, and R&D work were also studied. The formal educational system was found to have had difficulties in producing enough scientific and technical graduates to satisfy the demands of industry. A widespread system of nonformal education in the various companies had been established, using a variety of modes of training in the country and abroad. Employers and employees indicated that job performance and professional training were the most important criteria for recruitment. From 1980-86, oil firms somewhat increased the formal educational qualification structure of their employees. Employees stressed that higher education could make a significant contribution toward government-education-industry cooperation. (A survey and list of 12 references is appended.) (YLB)

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IIEP Research Report No. 79

# Development of the oil industry in Cameroon and its implications for education and training

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by Bikas C. Sanyal, Wilfred A. Ndongko, N.V. Varghese
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International Institute for Educational Planning

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IIEP Research Report No. 79

# Development of the oil industry in Cameroon and its implications for education and training

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A study undertaken jointly by the IIEP and the Institute of Human Sciences, Ministry of Higher Education, Computer Services and Scientific Research (MESIRES)

Paris 1990

International Institute for Educational Planning
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# The IIEP research project on the implications for educational planning of scientific and technological development policies

One of the principal underlying motives in the Institute's past activities has been the concern to fight effectively against inequalities of access and opportunity in the field of education. While this remains a priority, the Institute also needed to orient its research and training programme in the direction of one of the most glaring of contemporary inequalities, namely those prevailing between different levels of scientific and technological development. Recent experience has shown that this inequality, which must be viewed within the economic and socio-political context from which it springs, often determines many others, including those besetting education.

One of the principal tasks of Unesco is to help in enhancing the scientific and technological potential of those of its Member States which suffer from these inequalities. This is founded on the conviction that economic growth and social change cannot be sustained without the corresponding development of local technological capabilities. Research on this theme by IIEP is meant to contribute to this knowledge by building on the Institute's past work related to the relationship between education, work and employment.

This research programme does not in itself attempt an economic and social analysis of technological policies -- although it does of necessity take them into account -- but is chiefly concerned with investigating the relations between the various scientific and technological development policies on the one hand, and the content of educational policies and educational planning processes, methods and techniques on the other. The resulting conceptual, methodological and technical effort could ultimately be a source of enrichment to the Institute's training activities. The aim of these research studies and analyses is to examine the links between various policies and decisions relating to the processes of technical change and on-going educational

policy and practice, in order to identify the role effectively ascribed to educational planning, and possibly to draw conclusions with a view to improving its relevance and effectiveness.

In giving consideration to the diversity of scientific and technological policies and the diversity of the economic structures into which they have to fit, the research aims at revealing -- by using existing work and results where possible -- the processes by which the different qualifications of skills necessary to the implementation of these different technological policies are produced. In particular, attention has been paid to the criteria that govern the choice of different programmes and streams, and to the linkages, notably between science and technology teaching, technical teaching and vocational training, as well as to the relationship between training and production, and between higher education, applied research and fundamental research.

The choice of the research area was predicated on the assumption that specific industries which have been undergoing significant technological development and promoting development in other industries should be given priority.

This was the case with the Petroleum industry in Cameroon which experienced significant changes in recent years having an impact on the employment and qualification structure both within the industry and in other industries. These changes in the employment and qualification structure of the work force and the corresponding changes in educational and training requirements deserve analysis, understanding and articulation. It was also observed that several international agencies joined hands with the United Nations Industrial Development Organisation (UNIDO) to prepare a task master plan for industrial development in the country. The oil industry was considered as a key sector in this plan. These are the reasons for the IIEP undertaking a joint study with the Institute of Human Sciences of the Ministry of Higher Education, Computer Services and Scientific Research (MESIRES) to explore the relationship of the development in the oil industry with the development of education and training in the country so as to derive implications for planning of education and training within the country.

# Acknowledgements

A research covering the role of education and training in the development of the petroleum industry required close co-operation with the busy officials of the industry itself. For this we would like to thank all the officials of the eight petroleum firms who extended their co-operation in the conduct of the research and gave their valuable time not only in filling out the questionnaires but also in meeting the researchers personally for interviews on several occasions. Of all of them special mention, however, has to be made of Mr. B. Eding, Director General of SONARA (National Refinery Corporation), Mr. J. Rigaud, Director General, TEPCAM, Cameroon, Robert Engal, Resident General Manager, PECTEN, Cameroon, Mr. Ngii Nag Paul of SNH (National Hydrocarbons Corporation), Mr. A. Tali Abodo, Deputy-Director, Human Resources Ministry of Planning, Cameroon and Mr. Yves Mengual of Schlumberger. Special mention is to be made also of Mr. Enoh Ebob Felix, Director, Human Resources Division of SONARA (National Refinery Corporation) for his special contribution on the training programmes in SONARA. We also appreciate the co-operation extended by the Office of UNIDO in Cameroon.

We are grateful to the 213 employees who responded to our lengthy questionnaire. In fact it is their personal history which makes the core of the study. Needless to say we are not able to mention them by name. We do appreciate the encouragement received from Mr. Sylvain Lourié, the former Director of IIEP and Mr. Jacques Hallak, the present Director.

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Chapter I

# The research study, its objectives and methodology

## I. Introduction

The years since 1960 have seen a significant growth in the Cameroonian economy, but very little structural change until the favourable oil development after 1977. In fact, historically, agriculture was the main-stay of the economy, providing a livelihood for more than 80% of the population, accounting for about one third of the GDP and three quarters of total export earnings. However, since 1977 significant macro-economic developments occurred: these include the rising production and export of oil, and depressed world prices for Cameroon's traditional cash crops -- cocoa and coffee. The arrival of petroleum as a dominant factor in the Cameroonian economy eased the pressure on the cash crop sector to earn foreign exchange and provide governmental revenue. For example, between 1977/78 and 1983/84 oil production rose from one-half of one percent of GDP to 14%, while agricultural production fell from 32% to less than 25% of GDP. Overall the picture that emerges is one of fairly rapid industrial growth as a result of the pursuance of import substitution policies in addition to the impact of the oil industry. Such changes will require indigenous creation, adaptation and application of modern technology not only in the oil industry, but in other industries in the modern sector.

The local capital goods sector is extremely weak but the prospects of the intermediate goods industry are brighter because of the linkages it has with the oil industry. Though production of oil is an extremely capital intensive activity, Cameroon will in future rely more on home-made materials and labour.

Thus, this raises the issue of the nature of development of the oil industry in Cameroon, and questions relating to technological dependence and the country's technological policy, which have consequences for education and manpower training policies and programmes at both the national and industry level.

## II. The objectives of the study

Within the context of Cameroon's national development effort, the growth of the modern manufacturing/industrial sector is considered of strategic importance. The recent relatively high economic growth rate is due to a large extent to the oil sector and dependent industries. This study aims at analysing the development of the oil industry in Cameroon and how this has influenced the expansion, structure and content of the country's formal and non-formal education and training system.

In other words, the study will analyze the industrial and technological policies of the oil industry, their impact on employment and qualifications, structure of the work force and the industry's training and educational needs. It will then try to derive implications for the planning of education in Cameroon to make the education system more responsive to the needs of the oil industry and other modern sectors of the economy.

## III. The operational hypothesis

There were six working hypotheses:

1. Industrial policy for hydrocarbons in Cameroon has been formulated by Cameroonians keeping in view the long term development strategy of the country, independent of external intervention. It is proposed to show whether this policy has been adhered to and its effects. In doing so it would be pertinent to know the structure of industrialization within the country, and the role the other sectors such as agriculture and manufacturing are playing. Within the oil industry, what

areas have been developed - crude, refining, etc.? Finally, what is the extent of external influence/Cameroonian control and how is this achieved?

2. National policy for education and training in Cameroon has been formulated without taking into account the policy of the oil industry. This hypothesis seems to imply the independence of the two policy objectives, but the university and other higher educational institutions have provided the initial training required in the oil industry. Therefore, such independence would seem to be a disadvantage. It is proposed to establish the existence of such a gap, and the inherent disadvantages.

3. Technological policy in the oil industry has been formulated by Cameroonians and aims at creating local technological capability, taking into account the employment aspects, local environment and the cultural aspirations of the people. This hypothesis is related to the previous one above. It is proposed to investigate the extent to which Cameroon is capable of technological autonomy. Even partial autonomy is out of reach until a pool of national expertise exists and is properly organized to meet local needs.

4. Technological development in the oil industry is constrained by the lack of high level manpower.

5. Development of the oil industry has not significantly affected the country's pool of manpower or the quality of its manpower. An analysis of training carried out by the industry will be conducted. Our comparative results should indicate whether or not the development of the oil industry has made Cameroon more or less dependent on expatriate manpower.

6. In the context of Cameroon, as with other small developing countries, there is no need for the formal educational system to intervene in the training of manpower for the petroleum industry. In the complex phenomenon of technological development, the role of formal educational institutions in producing appropriate training programmes is very limited in that they are only one of several actors. In addition, most enterprises in the industry provide their own training which is more job and locality oriented. This hypothesis needs to be verified if future educational planning and policy-making is to respond to the technological development needs of the country.

## IV. Scope and limitations of the study

The general research problem examined in this study constituted an investigation of the extent to which development of the oil industry affected educational policy and planning in Cameroon.

The focus was on all major oil firms in the oil industry involved in one or several phases (functions) of oil production (exploration, development, production, refinery storage and distribution functions) in Cameroon. Ideally, it would have been useful to solicit information from a cross-section of all occupational categories. However, due to financial and time constraints, data was limited to a sample of skilled employees (i.e. technician level and above).

There were two other limitations of the study that should be noted. First, this study is by no means an attempt to evaluate the performance of any particular oil firm, para-public, public body, or government ministry or to criticize the formal education system in the country. It is rather an effort to identify elements for the formulation of policies in science and in technology education in general and in training and research in the oil industry in particular.

Second, regarding the policy relevance of this study, our particular sample precludes any broad generalizations largely because of the youth of the firms in the industry, their nature and size. The sample is a snapshot of oil firms, employers and employees interacting at one specific point in time. Once more we hope that our analyses will assist formulation of policy governing supply and demand of the human resources in the development of oil technology. Thus the study is restricted to the major oil firms, and their employees located in the Republic of Cameroon.

## V. Methodology

The relationship between technological development and education will be analyzed from three points of view: that of the State, of enterprises, and of employees. Since this study is focused on the oil industry, obviously the role of the State in the technological development of the oil industry and the corresponding educational and training programmes should be analyzed. For this, the study was to rely on secondary information. The major sources of secondary data were Government Reports, official published and unpublished documents and

statistics, the Five-Year Development Plans, the Ministry of Plan and Regional Development Annual Reports, Reports from the National Committee for the Transfer of Technology (CNTT) and the Master Plan of Industrialization.

From the point of view of the enterprises, structured interviews based on questionnaires were conducted with selected management and supervisory personnel to collect data on the activities, industrialisation policy, employment and training given. The results were analysed within the context of national development of the industry, information on which was derived from secondary sources.

In analysing the education-industry relationship from the point of view of the employees, the study was especially concerned with those employees that had attained a high level of education and/or training, that is, skilled employees from technician-level and above, who are working in the above firms. A sample was drawn, and selective interviews conducted. The main research questions related to:

i) personal characteristics
ii) family characteristics
iii) educational career
iv) professional training
v) employment career and
vi) their perception of the education-employment relationship.

Here also, the main thrust was on the impact of technological development on their own education and employment.

*The group of enterprises*

The oil industry in Cameroon though important for the economy, is numerically small which makes it ideal for the purposes of a research survey. There is only one refinery, three producers of crude, two firms dealing with petrol analysis and six major distributors and stockers of petrol plus some minor firms, making 17 in all. The survey was able to cover the refinery, two producers of crude, a chemical analysis firm and four distributors. It was thought advisable to limit the sample to firms working directly with oil and petrol and not to extend the survey to by-products which would greatly complicate the types of manpower involved.

The sample of firms was largely in the hands of multinationals though the refinery is Cameroonian and one distributor 51% Cameroon-owned. However, by size of employment, the refinery is by far the largest, so that adding the employees of the distributor firm, Cameroon firms represented 53% of employment in the group. Distributor firms were smallest in size (on average 162 persons), while producers of crude averaged 172 employees and the refinery over 400. Distributors had the lowest qualification structure of the work force and producers of crude the highest.

*The group of employees*

The survey aimed at obtaining a 25% response from the employees of each firm. However, completion of the questionnaire represented some difficulty to many employees and in the event, 213 responses representing 14% of the employees in the firms were achieved.

As expected in a new industry, the sample of employees was young (64% were 35 years or under and only 14% were 40+) (see Table I.1). Likewise 35% had five years or less work experience, and 40% 6-10 years, i.e. only 26% had 11 years or more work experience (Table I.2).

Table I.1 Age of the sample of employees

| Age group | Percentage |
|---|---|
| 22 - 25 years | 5.6 |
| 26 - 30 | 25.4 |
| 31 - 35 | 33.2 |
| 36 - 40 | 21.5 |
| 40 + | 14.1 |

Table I.2 Work experience of sample of employees

| Age group | Percentage |
|---|---|
| 0 - 2 years | 13.4 |
| 3 - 5 years | 21.5 |
| 6 - 10 years | 40.2 |
| 11 - 15 years | 11.6 |
| 16 + years | 14.4 |

As stated above, the intention was to obtain the views of the more educated employees and Table I.3 shows that this was achieved, 34% having higher education degrees, 30% technical college education and 29% senior or junior secondary education. They all (except for 9%) had a leaving certificate or degree relating to their level of education (see Table I.4), a large proportion being of a technical nature.

Table I.3 Distribution of employees by educational level

| Educational level | Number of employees | Percentage |
|---|---|---|
| Junior secondary | 24 | 11.1 |
| Senior secondary | 39 | 18.2 |
| Technical college | 63 | 29.7 |
| University (Bachelor) | 26 | 12.1 |
| University (Masters) | 40 | 18.8 |
| University (Ph.D.) | 6 | 3.0 |
| Others | 15 | 7.1 |
| Total | 213 | 100.0 |

Table I.4 Distribution of employees by type of qualification

| Type of qualification | Number of employees | Percentage |
|---|---|---|
| BEPC or CAP | 37 | 17.3 |
| Probatoire or GCE O/L | 19 | 8.7 |
| Bacc. or GCE A/L | 35 | 16.2 |
| BTS, DEUG, DESG | 23 | 10.9 |
| Bachelor degree | 22 | 10.5 |
| Post Grad. Dip. (Matrise) | 32 | 15.1 |
| Masters degree | 13 | 6.3 |
| Ph.D. (Doctorat) | 13 | 6.3 |
| Others | 19 | 8.7 |
| Total | 213 | 100.0 |

Table I.5 Distribution of employees by function

| Function | Percentage |
|---|---|
| R&D | 4.3 |
| Teaching | 0.5 |
| Design | 7.5 |
| Production | 25.8 |
| Maintenance | 14.0 |
| Sales | 7.5 |
| Management/office | 40.3 |
| Total | 100.0 (186) |

Slightly more than half (52%) of the employees worked on the technical side of operations in the oil industry (see Table I.5). The largest group was those working in Production (26%) followed by Maintenance (14%). R&D, Teaching and Design represented only 12.3%. The remaining 48% were mainly clerical/management (40%) with 8% being sales staff.

The majority worked in distributor firms (41%) followed by the refinery (31%), producers of crude (18%) and others (9%). They classified their positions in the firm as 39% professional, 33% technician, 12% skilled workers and 16% "other".

The sample thus represents all functions and positions in the oil industry, being biassed towards the educated elite whose opinions on education and training for development are of special significance. The questionnaire used is attached as Annex I.

Chapter II

# Economic development in Cameroon: the evolution of industrial policy and R&D activities

## Introduction

The United Republic of Cameroon is surrounded by Chad in the North, Central Africa in the East, Congo and Gabon in the South, Nigeria in the West and the Gulf of Guinea in the South-West. It has a population of around 10 million (1984) and covers an area of 474,000 square kilometres. It is categorised as a lower middle income economy with a per capita income of US$ 910 (1986). The majority of its population lives in the rural areas and the main economic activities and employment opportunities are centred around the primary sector in the rural areas.

The object of this chapter is to introduce and discuss the economy of Cameroon with special reference to technological policy, industrial development and R&D activities. Section 2 discusses the Cameroon economy in the colonial period. Section 3 deals with the development policy of the Cameroon economy from the sixties. Section 4 discusses the trends in development strategies and industrial policies during the decades of the sixties, seventies and early eighties. Section 5 deals with the evolution of R&D activities in Cameroon during the post-independence period, and the final section outlines the present economic situation and draws implications for the future economic development of Cameroon.

## II.1 Cameroon: the economy during the colonial period

Like many of the present day developing countries, Cameroon also has a colonial history, which though short (a period of 76 years), was under different colonial powers. The beginnings of the colonial history of the territory, which we now call the United Republic of Cameroon, began with the German occupation of the territory in 1884, which continued until the end of World War I. The colonisation of this period marked the beginnings of Cameroon as a separate territory. The economy was predominantly rural, but this period witnessed the emergence of a tiny modern sector dependent on foreign capital and skills, and the beginnings of a basic infrastructural network for communication and transport mainly to serve the imperial interests of extracting raw material resources and exporting primary goods from the country.

In the post-World War I period the territory became a League of Nations Mandate and was placed under the aegis of the British and French. The French occupied the East and the British West Cameroon. Following World War II the territory became part of the Trusteeship system of the UN. However, colonial rule and dominance of the British and French continued as before.

The French controlled part of Cameroon experienced more concerted efforts towards development than that of the British part. Between 1947 and 1957, the French initiated two development plans and established various financial institutions mainly controlled by the imperial power. The British did not develop such plans for Cameroon. This may be due in some degree to the fact that the territory was administered as a part of eastern Nigeria. The British did develop a plan towards the end of their colonial rule (1955-60), but unlike the French plan, this did not focus on encouraging private investment and no large scale direct productive investments were undertaken during this period.

The divergences in colonial policy towards development of the regions had implications for the future pattern of development between the Eastern and Western parts of Cameroon. The Cameroon economy during this period was primarily agricultural with a predominance of plantations. The West Cameroon under the British did not make any serious efforts to develop the secondary sector and hence it remained as a producer and exporter of primary products whereas East Cameroon

under the French saw the development of a manufacturing sector along with the primary sector. The East-West differences that are very obvious even today can partly be attributed to these differences in policies.

However, it should be noted that the emphasis of the imperial powers was on the development of basic infrastructure mainly in the areas of transport and communication. Nearly 85% of the plan allocations during the fifties were devoted to the construction of roads, railways and telecommunications (Ndongko: 1986). Since the economy was plantation based, colonial investment in the productive sectors concentrated mainly on producing primary goods for export (cocoa and coffee were the principal items).

Colonial investments increased output and employment, especially of unskilled labour. Most of the secondary sector activities were located in urban areas, especially Douala. In fact, the city of Douala accounted for nearly one half of the business organisations. Educated and salaried Cameroonians worked mainly in private European-owned firms. Because of the location of industries in the port city of Douala, there was large scale migration to this area and it evolved as the nerve centre of Cameroonian trade and commerce.

The East-West differences in development can be shown by the respective shares of East and West Cameroon in the export of major agricultural products. In 1960, East Cameroon accounted for 76% of export earnings from these items; cocoa and coffee accounted for nearly 69% of the total exports from this region. West Cameroon accounted for less than one-fourth of total export earnings, the principal items being palm oil and bananas which together accounted for nearly 60% of exports from the region.

Developments in the post-colonial period have not substantially changed this pattern, especially as regards location of industries. Nearly 80% of industrial establishments are concentrated in the Littoral and centre south (Ndongko: 1985, Table 4.3, p. 145).

## II.2 Development strategy in the post-independence period

In January 1960, East Cameroon under the French obtained independence and in October of the same year West Cameroon under the British opted for reunification; the Federal Republic of Cameroon was born in 1961. The referendum of May 1972 made it the United Republic of Cameroon.

At independence, the Cameroon economy was essentially traditional; the market for manufactured goods was limited, industrial know-how was poorly developed, resources for investment were lacking and the natural resources of the country other than agriculture were unknown. Manufacturing industries existing at that time concentrated on the first stage of processing of commodity exports.

Independence brought about changes in development orientations and the country soon initiated a policy of planned development. Five year plans became the basis for its economic development. By the late eighties, Cameroon had already completed five Five Year Plans and at present is in the midst of the sixth.

Cameroon development policy was based on the four principles of: (i) planned liberalism; (ii) self-reliant development; (iii) balanced development; and (iv) social justice (Ndongko: 1986).

Planned liberalism was to take place within the framework of a mixed-economy whereby both public and private initiatives were to be the motor for future development of the economy. Under this policy private initiatives were encouraged by the state. The role of the state enterprises was mainly in the traditional sectors and public utilities which support the productive sectors. In other words, under this policy the role of the state was mainly to create infrastructural facilities while the private enterprises ventured into more productive and profitable areas of investment. Such a strategy was important especially in the initial stages following independence because of the dominance of the private sector in the economy, and the more so because many of the private enterprises were owned and operated by foreign nationals. This policy helped in retaining the confidence of international investors and bankers to continue their activities in the country. It also helped in regulating the private enterprises and impeding them from attaining oligopolistic

power. In later periods the role of private enterprises and foreign capital in the development of Cameroonian economy declined and the role of the state increased.

The policy of self-reliant development was oriented towards reducing reliance on foreign capital and investments. Since Cameroon was predominantly an agricultural economy at the time of independence, the application of this policy was more pronounced in this sector, especially during the initial period. The government continued to emphasise agriculture as the backbone of the economy and self-sufficiency in food as one of the major and immediate objectives. The agricultural sector is dominated by private individuals, mainly small and subsistence farmers. Thus the policy followed by the government had to reflect this situation and resulted in the Peasant Plan of 1963 which helped to increase output. The government also provided protection to cash crops by maintaining a reasonably good price even when there were slumps in world market prices.

Though the policy of self-reliant development was successful in the agricultural sector, this was not the case for industry. The investment code of 1961 in fact encouraged foreign investment and know-how. Tax holidays, exemptions from customs duties, etc. provided incentives for foreign firms to continue their activities in Cameroon. However, industrialisation policy from the beginning of the third plan tried to curb reliance on foreign investment, and the setting up of new technical and financial structures (CAPME[1] and FOGAPE[2]) gave incentives to indigenous small and medium size enterprises. Consequently, in the seventies, the share of foreign investment in the Cameroon economy started declining and by 1980 it had come down to 48%.

The policies of balanced development and social justice were oriented towards providing equal opportunities and facilities between different sectors of the economy, regions of the country and social groups. Because of the colonial policy of concentrated development in selected areas, Cameroon at the time of independence had substantial

1. National Centre for Assistance to Small and Medium Size Enterprises.

2. FOGAPE : Aid and Credit Guarantee Fund for Assistance to Small and Medium Size Enterprises.

inequalities in this respect. For example, the Littoral had the highest concentration of industries (nearly 51%) followed by centre south (nearly 29%).

The distribution of population between regions in Cameroon was also highly unequal. There is a large concentration of population in the north and high densities in the mountainous west and around Yaoundé, whereas large areas of the tropical south have very low population densities. However, many of the high population density areas are neither rich in resources nor economically advanced. Recent government policies emphasise better distribution between the regions of small scale industries, rural development and decentralised administration and are oriented towards bringing about a more balanced development.

## II.3 Economic development in the post-independence period

Tables II.1 and II.2 give the overall picture of change in the economy since independence. In 1960/61 the primary sector contributed 46.5% to GDP and employed 90% or more of the labour force whereas by 1983 it contributed only 22% to GDP and in 1985 employed 70% of the labour force. The relevant figures for the secondary sector show a rapid rise, from 10.6% of GDP in 1960 to 34.6% in 1983 giving a rise in employment from 4% to 13%. The tertiary sector rose slightly from 42.9% to 43.4% of GDP but provided employment for 17% in 1985 - a rise of 8% over 1965.

The way these changes have come about are examined in more detail decade by decade in the following sections.

Table II.1 GDP by industrial origin (percentages)

| | 1960/61 | 1965/66 | 1970/71 | 1975/76 | 1980/81 | 1983/84 |
|---|---|---|---|---|---|---|
| Primary | 46.5 | 35.6 | 33.0 | 32.7 | 27.2 | 22.0 |
| Secondary | 10.6 | 19.4 | 19.0 | 19.5 | 27.6 | 34.6 |
| Tertiary | 42.9 | 45.0 | 48.0 | 47.8 | 45.2 | 43.4 |
| | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 |
| Total (in billion CFA francs) | 140.2* | 176.0 | 302.9 | 541.3 | 1796.3 | 3195.0 |

*At factor cost; for other years totals are at market prices.

Sources: (i) Direction de la statistique et de la comptabilité nationale.
(ii) For years 1980/81 and 1983/84 National Accounts.

Table II.2 Distribution of labour force by sector (percentages)

| | 1965 | 1976 | 1980 | 1985 |
|---|---|---|---|---|
| Primary | 87 | 79 | 75 | 70 |
| Secondary | 4 | 7 | 10 | 13 |
| Tertiary | 9 | 14 | 15 | 17 |
| Total | 100 | 100 | 100 | 100 |

Sources: (i) For the year 1965, World Bank (1988a).
(ii) For other years, Ministry of Plan and Regional Development (1986).

## II.4 Developments in the sixties

Cameroon had a labour force of around 2 million in 1960, most of which was engaged exclusively in agriculture - either in subsistence farming, small scale cultivation or commercial plantation. Wage earners accounted for less than 10% of the labour force; 50% were engaged in primary activities, 16.5% in the secondary sector, 6% in the tertiary sector and 17% in the government (Ndongko: 1986).

In 1965, nearly 84% of the population lived in the rural areas and 87% of the labour force was engaged in primary sector activities (Table II.2). The secondary sector employed 4% of the labour force and the tertiary sector 9%. Though the primary sector employed 87% of the labour force it accounted for only 35.6% of GDP whereas the

secondary sector which employed 4% accounted for 19.4%. The corresponding figures for the tertiary sector were 9% and 45% respectively. These figures show that labour productivity in agriculture was rather low when compared with other sectors of economic activity.

At independence the Cameroon economy was in deficit (-1.4 billion CFA Francs in 1960). However, by 1965-66 it achieved a balanced budget and by the late sixties, it had a surplus and reinvestible resources. The policies followed by the state and the favourable climate for development in the sixties are the major reasons for this spectacular achievement. In fact, the Cameroon economy during the sixties experienced a reasonably high rate of growth of between 6.5% and 7% per annum.

Development policies during the period 1960 and 1970 were marked by:

(i) An emphasis on retaining and attracting foreign capital and know-how; the new state pursued a strategy of industrialisation by invitation;

(ii) Emphasis on faster industrialisation in a mixed economic framework -- encouraging private initiatives and expanding the role of the state;

(iii) Adopting a policy of import substitution in crucial and selected areas;

(iv) Adopting a policy of protection of domestic market.

In the absence of a developed capital goods industry, the strategy of industrial development was able to provide only a weak consumer goods industry. The means of the state to attain its objectives included limited tax incentives, moderate protection against imports, joint ventures with foreign firms and participation in regional economic institutions (Cameroon is a founding member of the Customs and Economic Union of Central African States (UDEAC)).

Perhaps the most significant development during this period was the formulation and adoption of an investment code to guide future action in this area. The investment code was adopted by the National Assembly of East Cameroon as early as June 27, 1960 and was extended to the British Cameroon immediately after its reunification. The code ensured incentives for private individuals (national and foreign origin) to invest and permitted the state to play its role through the public sectors

Incentives to the private sector in the initial phases were, in a sense, essential given the dominant role and share of the private sector in the Cameroon economy.

The balance of payments was never a major concern in the sixties. Though the economy had deficits in its balance of goods and services they were more than covered by foreign capital inflow, mainly public capital. Consequently the foreign exchange reserves showed a continuous increase during the sixties.

In the initial stages of development, the economy continued to maintain trade relations with Britain and France. In 1958-59 nearly 75% of the exports from and 65% of the imports to West Cameroon were with the U.K. However, this share declined in the sixties. Similarly in 1962-63, 67% of East Cameroon trade was with France, which declined to 50.5% in 1965-66. By the mid-sixties the EEC as a whole replaced the British and French as the major trading partners. However, these two countries, especially France, continued to be the major supplier of goods to Cameroon. From the mid-sixties onwards, Cameroon's trade surplus with the EEC increased and the country initiated a policy of diversifying trade activities with other countries like Japan, USA, etc.

The financing of development plans in Cameroon was mainly from two sources: (i) public savings; and (ii) foreign aid. In 1968-69, 60% of public investments were financed by public savings and the remaining 40% by foreign aid. In the sixties, Cameroon was one of the economies with the highest per capita foreign aid.

Public savings increased dramatically during this period due to the public investment and taxation policies of the government. Public enterprises saw a sizeable expansion of their activities, and consequently, the cash flow from them showed a remarkable increase, at a rate of 10% per annum. Efforts to tax the local economy were successful and by 1965, taxes accounted for 33.75 billion CFA Francs which was roughly equal to 21% of the GDP for that year.

Unemployment was also not a major concern in the Cameroon economy in the sixties. With diversification of trading activities, continued expansion of enterprises (public and private) and financial and other institutional arrangements conducive to agricultural development (especially the 1963 Peasant Plan), growth in employment was reasonably high. Urban employment grew at a rate of 6.8% as against 7% growth in the urban population.

To sum up, the Cameroon economy in the first decade of independence showed remarkable progress in almost all areas of economic activity and laid the foundations for future growth of the economy.

## II.5 Developments in the seventies

In the seventies, the Cameroon economy experienced some of the strains of development. There was a slow-down in growth rates. This was due both to a slow-down in production of the rural economy and in the manufacturing sector. The cash flow from public enterprises also showed a decline, dropping from 2.5 billion CFA Francs to 1.5 billion CFA Francs between 1970 and 1974. Many of the large public enterprises found it difficult to cover debt services out of budget funds.

A good proportion of the public investment in the sixties was in public utility services and creation of infrastructural facilities. It was expected, in the earlier phase of development, that private investment would increasingly venture into productive areas. But this did not happen in the seventies. Private investments also showed tendencies to stagnate.

During the third Five Year Plan of the early seventies the government changed its industrialisation policy which affected industrial growth as well as investments in the industrial sector. Following reunification of East and West Cameroon in 1972 the formulation of national industrial policy took a different turn. During this period the government initiated and followed a policy of Cameroonisation. The new strategy attempted to reduce reliance on foreign investment and to encourage national initiatives for economic development. Many technical and financial institutions were established during this period. For example the National Investment Corporation (SNI) was created in 1973. Thus foreign investment showed a declining trend in the following years.

All these measures meant a further stepping up of public investment, which did increase in the early seventies, but became a problem later. Consequent upon the decline in the cash flow from public enterprises and a near stagnation in the growth of domestic savings, public investments had to seek alternative avenues of funding; in the initial stages mainly from the accumulated treasury reserves, which

which much reduced them. Between 1972-73 and 1973-74 there was a deficit of 16 billion CFA Francs in the financing of public investment. The foreign aid component also slowed down during this period.

The impact of balance of foreign trade was more serious. Cameroon was comfortably placed in terms of balance of trade and foreign reserves until the year 1973. But after that there was a reversal. The reasons for this are many. First, in 1974-75 the economy was adversely affected by trends in world trade. Consequently, import prices shot up by 50% and pushed up the import bill by nearly 60%. Second, exports declined partly because of slowing down of the primary sector (mainly due to the fall in the volume of exports of timber which declined by nearly 40%, while timber prices in the world market were also lower). The terms of trade had fallen by 40% in 1975. Third, the public debt by 1974-75 amounted to nearly 25% of GDP and debt servicing accounted for nearly 5% of total export earnings. Finally, there was the problem of devaluing the CFA franc which is tied to the French franc, as discussed below. As a result of these factors, the deficit increased. Cameroon which used to have budgetary surpluses was faced with budgetary deficits in the seventies.

The currency of 14 African states is the CFA (Communauté Financière Africaine) franc;[1] 50 CFA francs equal one French franc. This arrangement dates from 1948, but was modified after independence in agreements concluded in 1962 and 1973.

The countries using the CFA franc are in two groups. Seven former French colonies in West Africa use the currency issued by the Banque Centrale des Etats de l'Afrique de l'Ouest (BCEAO).[2] Five other French colonies together with Equatorial Guinea use the currency of the Banques des Etats de l'Afrique Centrale (BEAC).[3] The currencies in each of these countries are freely interchangeable at par and automatically exchanged for French francs at any time. This gives the CFA franc virtually hard currency status.

1) Except for the small island state, the Comoros which uses the Comoro franc.
2) These countries are Senegal, Mali, Côte d'Ivoire, Burkina Fado, Benin and Niger.
3) In the Central Africa region these countries are Gabon, Congo, Central African Republic, Chad, Cameroon and Equatorial Guinea (formerly Spanish colony).

Free convertibility of franc zone currencies already makes it relatively easy to move money into other hard currency areas, but more importantly from Cameroon into France and Switzerland. The fixed link with France eliminates use of any mechanism by individual countries to alter the exchange in their favour during economic slowdowns. In other words, it is difficult to devalue the currency. This is only possible if there is agreement between France and all the zone members to devalue against the rest of the world. Achieving such an agreement is difficult.

One reason many members think this arrangement is beneficial to them is that the parity with the French franc has helped to contain inflation, thereby limiting the amount of money in circulation. However, the opposite effect has also been felt when France sneezes, zone members catch a cold.

If we examine the trade statistics for Côte d'Ivoire and Cameroon which are producers of cocoa, it can be seen that their cost structures are uncompetitive. To be more competitive in the world market, the currency would have to be devalued. While Cameroon and Côte d'Ivoire (non-devaluors and members of CFA franc zone) are having export trade deficits and other structural problems, Ghana on the other hand, which devalued the Cedi several times in the past few years, has reversed the decline in exports as well as laid the foundations of an ISI (import-substitution industrialization) strategy for development.

In the context of the above economic pressures, industrial policy in the fourth Five Year Plan of the late seventies aimed at: (i) broadening the market for consumer goods; and (ii) increasing competitiveness of Cameroonian goods. This accent on competitiveness was based on the following considerations:

(a) disillusion with the import-substitution industrialisation (ISI) strategy of the sixties;

(b) the lack of secondary effects of industrialisation, i.e., its failure in generating employment and developing locally trained manpower for Cameroon's industrial development.

Added to these were the administrative and political problems which stood in the way of fast and consistent decision making. In fact, the fragmentation of responsibilities, lack of vertical and horizontal co-ordination and extreme centralisation of decision making resulted in long delays and inconsistencies in policy decisions.

The first population census was held in Cameroon in 1976. It showed a decline in the proportion of the labour force engaged in the primary sector and a corresponding increase for other sectors. This was mainly because of continued migration to the cities and had consequences on the urban unemployment situation for even when employment growth slowed down, migration to the cities continued, making unemployment in the urban areas a major concern for the public authorities. Urban employment which grew roughly at a rate of around 7% in the sixties declined to 2% in the seventies.

Thus trends in the seventies were very discouraging and the growth rate had declined to around 3% per annum as against 6.5-7% in the sixties. Deficit financing and unemployment became concerns for the government and economy activity was slowing down in all sectors. Fortunately during this period of slow-down, oil reserves were located and Cameroon became an oil producer in 1978. The discovery of oil had far reaching implications for overall growth and for the pattern of growth of the economy in the eighties.

## II.6 Economic development in the eighties

With the beginning of oil production, the Cameroon economy was able to attain high rates of growth. The contribution of oil to GDP consistently increased and by 1985, accounted for more than 17% of GDP and nearly 45% of total government revenues. Net foreign exchange earnings from oil represented nearly 35% of total exports of goods and non-factor services for the year 1985. The revenues from oil also permitted an expansion in other sectors of the economy, especially manufacturing and construction. Fixed investment grew from 21% of GDP in 1978 to more than 25% in 1981.

The years 1981 and 1982 were associated with large capital expenditures. During this period, Cameroonian industries witnessed a remarkable expansion. The public sector became dominant and it was further strengthened through the national investment corporation which

acquired the majority of shares in many corporations. The creation of the Centre to Assist Small and Medium Sized Enterprises (CAPME) and the Aid and Guarantee Fund for Small and Medium-Sized Enterprises (FOGAPE) further helped in sustaining the dominant role of the public sector in industrial development.

In the early eighties Cameroon launched its fifth plan (1982-86). The emphasis in the plan was on: (i) achieving self-sufficiency in food; (ii) diversification of the economy through production and processing of primary products produced locally; and (iii) reduction of inter-regional disparities.

As noted earlier, the agricultural sector in Cameroon is dominated by smallholder farming which accounts for nearly 90% of production. State-owned industrial plantations account for the remaining 10%. Value added from manufacturing accounts for nearly 13% of GDP, and here Government-owned enterprises and foreign-owned firms predominate, even though there were efforts from the early seventies to reduce foreign investment. Industrial growth during the late seventies and early eighties was rapid primarily because of public investment made in the aluminium and fertiliser industries during the fourth plan.

The first four years of the fourth Five Year Plan were marked by below average rainfall. In fact the drought in the year 1982-83 hit the whole economy adversely and was followed by another drought in 1984-85 especially in the far north region.

The development strategy followed by the Cameroon economy in the sixties, as mentioned before, was based on the Investment Code of 1961, but by the seventies strategy deviated from what was envisaged in this code. In the eighties the need for change was formally recognised and a new investment code was formulated and accepted in 1984. In the new code, industrial policy was geared towards "endogenous industrialisation" emphasising and encouraging small and medium size undertakings, giving incentives in the form of reduced import duties or exemption from taxes and duties on local purchases of equipment, raw materials and spare parts. This change in policy is partly due to the relatively moderate contribution of large capital intensive manufacturing enterprises to GDP in the seventies and partly due to the re-orientation of manufacturing production for domestic needs.

Another important strategy envisaged in the new code is diversification and dispersal of industrial activities. Though balanced development was one of the prescribed objectives of economic

development in Cameroon, industrial concerns concentrated in the regions of Littoral and Centre South. This pattern continued in the sixties and seventies. These two regions accounted for nearly 80% of business concerns in 1975. The new code provides preferential treatment to enterprises located in border regions and in other areas where access and supply conditions are difficult. As noted in Table II.2, the manufacturing sector experienced a rapid increase from 1975 to 1983 when it accounted for more than one-third of the GDP.

As a result of these efforts and the positive conditions for development, the economy achieved very high rates of growth. GDP grew at a rate of 10% between 1979 and 1985, primarily due to growth in the oil sector. The oil and mining sector grew at a rate of 55% per annum during this period, while the non-oil sector grew at a rate of 7.9% (which is nevertheless more than double that of the seventies and higher than that of the sixties).

Another significant change that can be noticed in the eighties is the changing composition of exports. Because of the drought and the dominance of the oil sector, the export of coffee and cocoa which used to be the dominant traditional items of export from Cameroon, declined from 66% in the early seventies to 58% in the eighties. There was at the same time a marked increase in the share of industrial products in exports, from 10% to 20%. In other words, the Cameroon economy is slowly but steadily shifting from its traditional position as an exporter of primary products to an exporter of industrial products. Recently the USA has become the major customer for Cameroon goods. In 1983-84 USA accounted for 39.8% of total exports, higher than France which saw a continuous decline from 50% in 1970-71 to 36.5% in 1983-84.

One special feature of the Cameroonian oil economy is that oil revenue is not included in the government budget, except for tax on the foreign share of the oil and a significant part is saved abroad. It has thereby avoided to some extent being infected by the "Dutch disease", whose symptoms are heavy dependence on oil for foreign exchange.

Urbanisation is increasing at a rapid rate, at around 5.3% per annum. Since 1976, 65% of the population growth in the country as a whole has taken place in the urban areas. In 1984, the urban population accounted for more than 40% of the whole. If these trends continue nearly one-half of Cameroonians will be in urban areas by the beginning of the next century.

Cameroon is in the process of implementing its sixth Five Year Plan (1986-91). The major concern of the government in this plan period is "strike a balance between population, resources and development" (Ministry of Planning and Regional Development: 1986). The government is attempting to develop a master plan of industrialization during this period, i.e. to build, articulate and apply a coherent medium-term strategy that recognizes the importance of the private sector in contributing to an overall industrialization process. This strategy has been termed an integrated strategy. How different it is in terms of the implications for future patterns of industrial sector production from the previous strategies, especially the open competition strategy, is not clear.

Though industrial policy is putting more and more accent on the private sector, planning will continue to play a central role in the industrial development of Cameroon. The reduced but direct role to be played by the state is demonstrated by the demand for privatisation of certain inefficient public enterprises supported by the National Investment Corporation. Industrial planning and the economic environment must above all serve as a framework for encouraging the private sector. These objectives are defined in development plans which clearly show the priorities of the government. They may be summarized as follows:

1. Food self-sufficiency by developing the rural sector.
2. The promotion of forestry resources.
3. Industrial development based on the exploitation of local primary resources (forestry and minerals).
4. Encouraging Small and Medium-Sized Enterprises.
5. Improving the overall infrastructure.
6. Regional development.

The manner of realization of these objectives has been set out in detailed sectoral reports prepared by the United Nations Development Programme (UNDP) and the Ministry of Plan and Territorial Development and is known as "The Master Plan of Industrialization" (PDI).

## II.7 R&D efforts in Cameroon

Industrial development of any country is highly influenced by R&D contributions. In Cameroon R&D efforts are at a stage of infancy. Indigenous technological development has yet to take deep roots. However, infrastructural facilities for R&D have been created. Within the framework of Decree No. 62/DF/364 of 2 October 1962 the Council for Applied Sciences and Technical Research was created which established five research commissions among which was one for hydraulics and geology (Nya: 1982). This was one of the first efforts after independence to set up a national institution responsible for scientific and technical research. It should, however, be mentioned that at this early stage, the execution of research programmes was mainly entrusted to French specialized institutes. In the early independence years there were virtually no Cameroonian researchers in the French speaking part, although a handful could be found in the English speaking part of Cameroon.

Because of the lack of nationals in various research areas Cameroon government signed an agreement with France in 1963 placing the management of Scientific and Technical Research under various French specialized institutes; that which carried out mineral research was the Bureau de Recherches Géologiques et Minières (BRGM).

Recognizing the invaluable contribution of research to the rapid development of any country, the Federal Government promulgated a law on 22 May 1965 creating the National Office for Scientific and Technical Research (ONAREST) which replaced the old Council but became operational only in 1974, with the objective of coordinating the activities dispersed in several national structures entrusted to foreign research organisations. Scientific research became the responsibility of the Federal Government by Law No. 69/LF/14 of 10 November 1969. ONAREST had nine institutes with two of them devoted to mineral and technological research. The Hydraulic and Mineral Research Institute with headquarters in Garoua (North Province) had the objective of conducting mineral laboratory research as well as carrying out energy research in all forms. The Institute for Industrial and Technological Research had research operations in three organizations: the Public Works Laboratory, the National Centre for Agricultural Mechanization Studies and Experimentation (CENEEMA) and the Wood Centre at Nkolbisson (Nya: 1982).

Within a few years ONAREST ran into severe problems, including a shortage of qualified administrative and research staff and a lack of sufficient funds to carry through research programmes. It was later reorganized and its name changed to the General Delegation for Scientific and Technical Research (DGRST) by a decree (No. 79/473) in 1979. Within the framework of DGRST, five research institutes were created, namely (i) The Institute of Agricultural Research (IRA), (ii) The Institute of Zoological Research (IRZ), (iii) Institute for Geological and Mining Research (IRGM), (iv) The Institute of Medical and Medical Plant Studies (IMPM), and (v) The Institute of Human Sciences (ISH). IRGM was entrusted with the task of elaborating programmes and undertaking research in all branches of hydraulics, soil, mineral and energy development with the view to improving mineral resources production.

Conscious of the important role that scientific and technical research could play or was playing in the socio-economic development of the nation and also in an effort to concentrate qualified manpower in University institutions, the Ministry of Higher Education and Scientific Research was created in 1984 and reorganized in 1988, thus abolishing the General Delegation for Scientific and Technical Research (DGRST).

Conspicuously absent from the roles assigned to research organs evolved in the past two decades (ONAREST, DGRST and MESRES), was the task of designing and developing local technologies for industries. Even Cameroon National Union (CNU) Congress held at Bafoussam in 1980, which was dubbed as the "Congress of the Mastery of Our Development" made no reference to the urgency of developing an institute which caters for technological development. However, technological development (and research) received its inspiration from the government policy (expressed in the fifth and sixth Five Year Development Plans) to set up a Technological and Industrial Research Institute (CNU: 1981).

Although such an institute still remains to be set up, the National Committee for the Transfer of Technology (CNTT) was set up in April 1978 (by Presidential Decree No. 78/09) and later transformed into the National Committee for Technological Development (CNDT). CNDT has wide and challenging responsibilities including cataloging national needs in the realms of science, technology and industry, studying modalities for the transfer, adaptation and use of technology and selecting foreign technology that would contribute to Cameroon's

development. So far CNDT has compiled an inventory of equipment, scientific materials and techniques and even organized in 1985, a National Technology Day.

Although Cameroon, like most Third World countries can enjoy the advantages of being a latecomer on the scene of technological modernization, the government cannot take technological short cuts. Technology is not free but an economic good sold dearly to those who can pay for it, not to those who need it most. The institutional capacity to continuously generate technology and in a self-sustaining fashion constitutes a priceless asset.

In order to back up its policy of giving greater importance to research, the government embarked on heavy investments in human resources. The recruitment and training of researchers received top priority and the promulgation of the general status of researchers in 1980 certainly helped research in Cameroon. The institute of Geological and Mining Research (IRGM) could boast of only 12 researchers at that time, but by 1986 the number had risen to 35. Emphasis was placed on qualitative recruitment, junior researchers were now required to have Masters degrees. Preference was given to those who had some research experience in laboratories abroad. Others were sent abroad to upgrade their skills.

In the 1986/87 fiscal year there were some 348 full time researchers divided amongst the five research institutes that form part of the Ministry of Higher Education, Computer Services and Scientific Research. By rank, there were six directors of research, 21 senior researchers, 139 research fellows and 182 research assistants (see Table II.3). There were some 200 additional workers known as laboratory technicians and assistant technicians.

Table II.3 Cameroonian researchers by grade (1986/87)

| Institute | Research Grades | | | | |
|---|---|---|---|---|---|
| | DR | SR | RF | RA | Total |
| Institute of Agricultural Research (IRA) | 3 | 3 | 32 | 62 | 100 |
| Institute of Zootechnical Research (IRZ) | - | 3 | 13 | 41 | 57 |
| Institute of Medical Research and Medicinal Plant Studies (IMPM) | 1 | 4 | 23 | 19 | 47 |
| Institute of Geological and Mining Research (IRGM) | - | 3 | 13 | 19 | 35 |
| Institute of Human Sciences | 2 | 8 | 58 | 41 | 109 |
| Total | 6 | 21 | 139 | 182 | 348 |

Source: Compiled from the research offices of the various institutes.
DR = Director of Research
SR = Senior Researcher
RF = Research Fellow
RA = Research Assistant

Contemporary R&D as carried out within this ministry has two types of orientations that divide it into two blocks of workers: the scholars (social scientists) and the technicians (physical scientists). Both work according to the tradition of free intellectual inquiry and both assume continuity and relevance between their respective areas of research and development. But the technical institutes (or the hard-core sciences) IRA, IRZ, IMPM and IRGM who are considered to work in areas which are highly relevant to Cameroon's development priorities (for example, research in oil geology), tend to be smaller than the Institute of Human Sciences (ISH) which has the largest number of researchers. This may be a function of availability of staff.

Originally when the Institute of Human Sciences was created, research operations were initiated by individual researchers. Most of this individual initiated research did not reflect national priorities. It is only within the last four years that the research operations and programmes of the institute reflect the priorities of government industries and para-public institutions. Unfortunately this improved research orientation is taking place at a time when research organisations are facing a financial squeeze which adversely affects their successful operation.

Though great strides have not been made in the petroleum and energy sector per se, progress is being made in the food and agricultural sector as reflected by development priorities. In the past five years Cameroon has spent over 135 billion CFA francs to support scientific and technical research and this amount will be increased by 53.9 billion CFA francs for the next five years. Geological and mineral research (IRGM) received slightly under 15% of this sum and the percentage is likely to increase given the state's interest in the sector. Research in this area has been funded by the state which provides 90% of grants (Table II.4).

Table II.4 Grants awarded to IRGM (million CFA francs)

| Year | Investment budget | Recurrent budget |
|---|---|---|
| 1973/74 | - | - |
| 1974/75 | 67.90 | 5.00 |
| 1975/76 | 108.50 | 148.15 |
| 1976/77 | 24.87 | 546.04 |
| 1977/78 | - | 546.96 |
| 1978/79 | 22.04 | 577.44 |
| 1979/80 | 46.81 | 178.77 |
| 1980/81 | 250.00 | 225.60 |
| 1981/82 | 401.00 | 325.00 |
| Total | 921.12 | 2 552.97 |

Source: Nya Ngatchou, J. *Evolution de la Recherche Scientifique et Technique au Cameroun*, Yaoundé: DGRST, 1982.

According to the Lagos Plan of Action elaborated in 1980 by African Heads of States, each country was expected to raise its financial support to research to 1% of GNP by the year 2000. Inspired by this recommendation, Cameroon dramatically increased its financial commitment to science and technology. The recurrent and investment budgets between 1982 and 1985 went up significantly but because of the economic crisis were stabilized in 1985/86.

It should be pointed out here that although the government continues to support research institutions, the Institute for Geological and Mining Research has no particular research operations on petroleum. Their research operations are limited to applied geology which can be reduced to cartography or the detailed study of rock systems. The major

problem is the lack of infrastructure and a very weak relationship between the formal research institutions such as IRGM, the private multinational oil companies and the state hydrocarbon corporation (SNH). IRGM's research operations are thus limited to energy research programmes which are basically related to (and reduced to) junior researchers finishing their M.Sc. degree theses. There are no direct connections of such research programmes with what may be going on in the oil industry.

This brief historical sketch on the evolution of scientific and technical research in Cameroon has shown that R&D has to a large extent been a monopoly of the state in the sense that it is the state which has attempted to develop the necessary scientific and technical skills, and to provide the infrastructural environment for it to grow. While the country lacks national technological capacity, and presently conducts little R&D, it has the basic skilled manpower.

In the private sector, very little R&D is carried on at the moment. In the oil sector in particular R&D is almost non-existent because the industry is controlled to a large extent by a group of multinational oil corporations who have little incentive to encourage the establishment of local R&D capacity, except in very peripheral areas such as ground maintenance, transport and food supply but not in oil itself. R&D in the oil sector will not occur without government intervention, perhaps through SNH. The state of R&D activities in the petroleum industry is described in Chapter III.

## II.8 Future prospects

Cameroon which started as a poorly developed colonial economy in the sixties has shown a tremendous amount of development. Unlike many developing countries, it has not fallen into the "debt-trap". Indigenous orientation of development has improved in terms of self-reliance and self-sufficiency in food, and the economy is in the process of a structural transformation from the primary to the secondary and tertiary sectors. However, it needs to be emphasised that the growth of the secondary sector from the late seventies has surpassed that in other sectors. Manufacturing accounts for more than one-third of GDP and its share in exports doubled between 1965 and 1984. This increasing industrialisation is also associated with growing urbanisation, and unemployment has not risen to any great extent. The government's most

recent policy reflected in the investment code of 1984, is aimed at diversification and dispersal of industries and emphasis is on small and medium size enterprises to meet domestic demand. Thus with the recent strategies of development and if resources continue to be available from oil exports, the prospects for the future development of the economy would seem to be bright. Oil production and its export are a major engine of growth of the economy and therefore the pattern and direction of development of the economy in the future will be influenced by the growth and stability of the oil industry which is the subject matter of the next chapter.

Chapter III

# Development of the oil industry in Cameroon

## Introduction

Chapter II described the pattern of economic growth and the changing industrial development strategies of the Cameroon. It was noted that in the late seventies, the economy benefitted greatly from the establishment of the oil industry. The purpose of this chapter is to show in more detail the importance of oil in terms of its export earnings, contribution to revenue, and impact on employment as well as describe the industry's structure, activities, growth of production and R&D work.

## III.1 The importance and growth of the oil sector

As noted in Chapter II, the secondary sector developed rapidly as from the late seventies, to which the oil industry greatly contributed (Table III.1).

Table III.1 Rates of growth in the secondary sector of Cameroon

| Rates of Growth % | 1972-78 | 1978-84 |
|---|---|---|
| Industry | 7.5 | 15.7 |
| Mines and Petrol | 3.8 | 63.4 |

Source: Rapport final, *Plan Directeur d'Industrialisation du Cameroun* 1986/87 - 1990/2000.

Prior to the development of the oil sector, the Cameroonian economy was predominantly agricultural but in less than seven years (1977-84) the cash crop contribution to GDP declined, from roughly one-third to 20% and its exports as a percentage of GDP from 14.7% to 3% (Table III.2).

Table III.2 The importance of cash crops sector in the Cameroonian economy: pre-oil and oil period

| | 1977/78 | 1979/80 | 1980/81 | 1981/82 | 1982/83 | 1983/84 | 1984/85 |
|---|---|---|---|---|---|---|---|
| 1. *GDP* (Billions of CFAF) | 945.8 | 1365.4 | 1744.1 | 2155.7 | 2552.9 | 3056.6 | 3838.9 |
| Agriculture as % of GDP | 32.3 | 29.6 | 27.9 | 27.2 | 25.6 | 24.0 | 20.5 |
| Oil as % of GDP | 0.3 | 4.3 | 8.7 | 11.9 | 13.2 | 14.0 | 18.9 |
| 2. *Exports* | | | | | | | |
| Cash Crops Exports as % of GDP | 14.7 | 10.6 | 7.8 | 5.6 | 5.1 | 4.0 | 3.2 |
| Oil Exports as % of GDP | 0.3 | 6.1 | 12.4 | 14.0 | 16.4 | 16.4 | 18.1 |

Source: Carole Gagne - Gervais: "The Cash Crop Sector: Its Performance and Future Development Possibilities". USAID, 1986, Yaoundé, p. 7.

Oil, on the other hand, rose from .3% of GDP to 18.9% and its exports from 0.3% to 18%. In 1978 agriculture accounted for more than 70% of export earnings. Cocoa and coffee were the principal items, representing 36% and 28% respectively while oil accounted for a modest 1.4% (Table III.3).

Table III.3 Percentage composition of Cameroonian exports in selected years*

| | 1977/78 | 1980/81 | 1983/84 | 1985/86 |
|---|---|---|---|---|
| 1. Main export crops | 71.9 | 32.4 | 20.9 | 21.5 |
| Cocoa and products | 36.0 | 12.9 | 8.7 | 8.2 |
| Coffee | 25.1 | 14.4 | 7.9 | 7.5 |
| Cotton | 1.9 | 2.5 | 2.2 | 2.5 |
| Bananas | 2.1 | 1.2 | 1.1 | 1.8 |
| Rubber | 0.8 | 0.3 | 0.6 | 0.6 |
| Tobacco | 2.5 | 0.8 | 0.3 | 0.5 |
| Palm products | 0.5 | 0.3 | 0.1 | 0.4 |
| 2. Petroleum | 1.4 | 42.1 | 67.8 | 65.4 |
| 3. Others | 26.7 | 25.5 | 11.3 | 13.1 |

* Based on current CAF values, f. o. b. as recorded in customs data.

Sources: World Bank and Ediafric, *Bulletin de l'Afrique Noire*, various years.

However, by 1985, agriculture represented only 21.5% of total exports and petroleum 65.4%.

## III.2 Evolution of the Oil Industry

The growth of oil exploration in Cameroon has been a recent phenomenon. In the early 1950s, crude oil prospecting was started by a French exploration company, Elf-Aquitaine (SNEA) and was continued by its local subsidiary Elf-SEREPCA.[1] During the first eight years (1951-1959) exploration activities were limited to on-shore areas and it was not commercially viable. After several unsuccessful attempts, attention was directed to off-shore prospecting in 1963. Here too, success was slow. It took almost a decade for ELF-SEREPCA to

1. The Société Nationale Elf-Aquitaine (SNEA) was the first corporation to explore for petroleum resources in Cameroon around 1951.

produce any convincing evidence that there were indeed oil reserves in Cameroon. In 1972, the first Cameroonian oil was brought to the surface at a place called Bétika, in the basin of Rio Del-Rey in the Southwest of Cameroon, almost at the Nigerian frontier.

But it was not until 1976 that oil was found in large enough quantities to make it a commercially viable and attractive industry. The actual production of oil started only at the end of 1977 under a joint venture between the French company Elf-Aquitaine and the Cameroonian public corporation, the Société Nationale des Hydrocarbures (SNH). In terms of its geographic distribution, the oil industry is largely concentrated in the south-western region of the country, although explorations are now being carried out in North Cameroon. As a modest producer, ranked as thirteenth producer in the world in 1984, proven reserves are located mainly in Rio del Rey basin, which has been heavily explored in the last ten years. In addition, extensive natural gas deposits are known to exist in Kribi and Logbaba in the Littoral region.

Since 1977, production has been exclusively off-shore. In 1978, crude oil production was 625,000 tons which rose to 1.7 million tons in 1979, 2.8 million in 1980 and 4.3 million tons in 1981.[2] Since then no official figures have been forthcoming, but production was estimated to have almost doubled between 1982 and 1984. In 1985 oil production was estimated to be 8.40 million tons and was thought to have reached its highest level of 8.85 million tons in 1986 after which it fell to 8.28 million tons in 1987. It is projected that production will decline from now on to 3.6 - 4.6 million tons by 1991 because by that time known reserves will be exhausted. The precise production quantity will of course depend on the evolution of oil prices. According to a recent study, we can expect prices to reach around $20 per barrel (1984 constant prices) at the end of this decade. They may continue at that level thereafter.[3] From a more optimistic view point, we can expect an annual augmentation of 7 per cent in real terms provided the price level of $20 per barrel is attained. Projections for the future show that, oil production is expected to fall by 1.0 to 2.4 million tons annually until

2. See *L'Economie Camerounaise*, p. 124.

3. See Rapport Final *Plan Directeur d'Industrialisation du Cameroun*, Etude Sectorielle No. 9 "Le Pétrole", Ministère du Plan et de l'Amenagement du Territoire, Yaoundé, 1988.

1995/96. In other words, from the peak years of 1985 and 1986, production would steadily decline in the early 1990s and dry out completely by the mid 1990s. Under this scenario, as from 1994/95, Cameroon will become a net importer of petroleum (Table III.4).

Table III.4 Cameroon Oil Production: 1977-1987 (million tons)

| Year | Nicod Estimates | IOI Estimates | Other Estimates |
|---|---|---|---|
| 1977 | - | - | 0.41 |
| 1978 | - | 0.12 | 0.63 |
| 1979 | 1.4 | 1.00 | 1.71 |
| 1980 | 2.8 | 1.90 | 1.71 |
| 1981 | 4.0 | 3.40 | 2.80 |
| 1982 | 5.2 | 4.70 | 5.50 |
| 1983 | 6.3 | 5.80 | 6.00 |
| 1984 | 7.6 | 7.00 | 8.00 |
| 1985 | 7.6 | 8.4 | 8.24 |
| 1986 | 7.3 | 8.20 | 8.85 |
| 1987 | 7.0 | 8.10 | 8.28 |

Source: Nicod 1983, International Oil Industry estimates and Ediafric, Bulletin de l'Afrique Noire, 1980, *Plan Directeur d'Industrialisation du Cameroun*, Etude Sectorielle No. 9, 1988.

The official policy so far has been to minimize the importance of hydrocarbon resources. The Fifth Plan (1981-1986) made only passing reference to perspectives for activities of the Société Nationale de Raffinage (SONARA), the State oil refinery, while the Sixth Plan (1986-1991) briefly remarked on a programme of constructing petroleum depots in the country.[4]

However, the country's "Plan Directeur d'Industrialisation" (Master Plan for Industrialisation) includes the petroleum industry as one of the strategic industries for the country's development. The plan which is drafted by UNIDO and is still under discussion, envisages four programmes related to the petroleum industry: (1) extension of the petroleum refinery at SONARA, (2) setting up of a complex for

4. See the *Sixth Five Year Economic, Social and Cultural Development Plan*, 1986-1991, Ministry of Plan and Regional Development, Yaoundé 1986, p. 123.

exploitation of natural gas, (3) setting up of a complex to transform natural gas into ammonia/urea and methanol, and (4) construction of facilities for production of plastic materials from petroleum by-products. The plan period extends to the year 2000.

The extension of the refinery under a modest assumption would need an additional staff of 70 - 120; the proportion of engineers, foremen, operators and other technicians will be 1:1:8:6. An alternative scenario with more optimistic assumptions calls for an additional manpower requirement as follows:

| | |
|---|---|
| Engineers | 80 |
| Foremen | 38 |
| Operators | 245 |
| Technicians and others | 187 |
| Total | 550 |

Actual implications for training will be known only when the plan is finally accepted.

The natural gas complex will need 400 staff by the year 2000, 60% professional and 40% others. 25% of the total staff will be needed for administration activities, and the same proportion would be professional engineers. The complex will also need 211 man months of expatriates by the year 2000.

The complex to transform natural gas into ammonia/urea and methanol will need 427 staff for the former and 309 staff for the latter and an additional 26 expatriates. Construction of a complex to produce plastic materials will need 117 national professionals and technicians and four expatriates. The plan thus assumes a strong dependence on technology imported from abroad.

## III.3 The structure of the petroleum industry

The petroleum industry of Cameroon is engaged in all stages of petroleum production, namely: (i) exploration, (ii) development of infrastructure, (iii) production of crude oil, (iv) storage of crude oil, (v) storage of petroleum products, (vi) distribution of petroleum products, and (vii) development of petro-chemicals.

In Cameroon exploration involves getting a permit, H permit -- from the Ministry of Mines, Water and Energy. In accordance with decree No. 64/LF/3 of June 1964, it may be issued only to persons or business firms with adequate technical competence and financial capacity to undertake the operations, to legal residents of Cameroon and once obtained is valid for 25 years. As noted earlier, activities in this area initially centred on on-shore exploration and later shifted to off-shore explorations. However, with the decline in petrol prices in the world market in 1986, exploration activities in Cameroon were reduced.

The Société Nationale des Hydrocarbures (SNH)[5] controls at least 50% of marketable oil production. Foreign investment in this area is through SNH and foreign firms reimburse 50% of the expenses to SNH once oil production begins. There exists in Cameroon petroleum byproduct industrial firms like GETRAM which replaced the erstwhile foreign dominated BOSCAM. More than 50% of the shares of GETRAM are controlled by the government through SNH. The Union Industrie Cameroon (UIC) is responsible for construction of metallic sea oil platforms. This firm is almost entirely controlled by private foreign enterprise (France - Bouygues).

SNH does not directly participate in production operations. There are many foreign firms involved in these under clearly defined guidelines for contractual arrangements with the government. According to the guidelines:

(i) the state's share in the case of firms with a production capacity up to 5 million tons of oil is 60% and that of the foreign firms is 40%;

(ii) the state's share in the case of firms with a production capacity between 5 to 10 million tons of oil is 65% and that of foreign firms is 35%;

5. The Société Nationale des Hydrocarbures (SNH) was created by Presidential decree on 12 March 1980 to represent and defend the interest of the state in all affairs pertaining to the petroleum industry. To achieve this mission, the SNH:
i) signs and follows up all the agreements of participation between the state petroleum companies in the research and production of hydrocarbons;ii) judiciously recruits young and dynamic Cameroonians to allow it to take advantage of this partnership and to be able to master the operation of the petroleum industry; and iii) participates in indigenous enterprises and ancillary firms in the oil sector.

(iii) the state's share in the case of firms with a production capacity equal to or greater than 10 million tons is 70% and that of foreign firms is 30%.

Oil is produced in Cameroon by three foreign multinationals -- ELF-SEREPCA (a subsidiary of ELF-AQUITANE of France), Total Exploration Production Cameroon (TEPCAM) (a subsidiary of Total LFP of France) and PECTEN Cameroon (a subsidiary of American Shell). Among these firms ELF-SEREPCA accounts for 65% to 70% of total oil production, while PECTEN accounts for 25-30% and TEPLAM for less than 10%. Baroid and Hydrac are firms involved with the quality control measures of petroleum by-products. Baroid is a foreign dominated agency while Hydrac is controlled by SNH. The first state refinery (SONARA) was inaugurated in 1981 at Pointe-Limbe on a 42 hectare site about 13 km from Limbe town in the South West Province. Production which began in 1981 consists of a refinery with a capacity to produce 2 million tons per year of crude oil, off-shore installations and housing for the administrative unit. The refinery is of the hydroskinning type and treats only Cameroonian crude (although it is capable of treating other types of crude petroleum which may be supplied by SNH).

The refinery produces the following products: butane, ordinary petrol, super petrol, lighting petrol, kerosene, gas oil, and jet fuel. These products are taken to Douala by boat and tanker and from there by truck to other parts of the country. According to a recent study, the refinery can satisfy the needs of the country with regard to light petroleum products like ordinary petrol, kerosene, gas oil, etc. Its production of GPL is insufficient while there is a surplus of fuel oil which has to be exported.[6] The refinery will reach maximum capacity in 1991/92. An extension of the refinery at that point will be necessary. The first extension would be a conversion unit to increase the production of petrol (ordinary and super) and GPL while reducing that of fuel oil.

6. See Rapport Final *Plan Directeur d'Industrialisation du Cameroun*, op. cit., p. 11.

Table III.5 Oil production of the SONARA refinery and disequilibrium in demand and supply (million tons)

| Product Type | 1987/88 Production | Excess(+) or Deficit(-)a | Annual Growth based on local demand | 1991/92 Production(b) | Excess (+) or Deficit(-)a |
|---|---|---|---|---|---|
| Super petrol (and jet fuel) | 284 | 0 | 8.5 | 389 | -5 |
| Ordinary Petrol | 47 | 0 | -5.0 | 12 | -26 |
| Kerosene | 137 | 0 | 2.0 | 187 | 0 |
| Gas Oil | 335 | +52 | 3.0 | 430 | +111 |
| Fuel Oil | 697 | +631 | 1.0 | 825 | +757 |
| GPL (liquified gas-petrol) | 21 | -5 | 20.0 | 24 | -30 |
| Treated Crude | 1 669 | n.a. | n.a. | 2 000 | n.a. |

a) The international supply of petroleum products to Cameroon and other limited exports to neighbouring countries are included in the local demand.
b) Calculated by SONARA.

Source: *Plan Directeur d'Industrialisation du Cameroun*, Etude Sectorielle No. 9, 1988, p. 10, Table 3, UNIDO.

Apart from small companies and individuals, there are six large foreign based firms involved in the marketing and distribution of petroleum products in Cameroon. They are TOTAL, MOBIL, AGIP, TEXACO, SHELL and BP. Many of these firms are quite old - established and existed in Cameroon even before it was an oil producer. In order to guard against aggressive inter-firm market competition, these firms are now associated in the Groupement Professionnel des Petroliers (GPP).

Distribution was initially an independent activity of different firms and individuals. Of late there has been an attempt to integrate such activities. One of the Canadian firms - SAFIMAR - is in the process of developing an integrated network for the distribution of petroleum products including GPL.

The growth of petrochemical industries is rather slow in Cameroon. This is due partly to the small market and partly to the present economic situation. The per capita consumption of plastic products is only 2.6 kg which is very low in comparison with the developed countries. At present there exists about a dozen firms

engaged in the production of plastic goods, but they depend on imports for their production. Of the firms involved in petrochemical industries, three are under the total control of the government, two under the total control of foreign firms and the remainder are under the joint control of the state and foreign firms.

To sum up the situation, Cameroonian production of crude is controlled to a large extent by private multinational oil corporations. When the oil industry began contributing enormously to Cameroon's GDP, there were some seventeen firms in the industry. At the moment only three firms -- Elf-SEREPCA, Pecten-Cameroon, and Total Tepcam -- are engaged in the exploration and exploitation of oil in Cameroon. In some cases they organize and contract out certain of the work related to exploration to smaller firms, which are always foreign private firms.

As oligopolies and subsidiaries of multinational corporations, they seek to maintain their levels of retained earnings and growth through non-price competition. These oil companies aim to acquire sufficient crude for their integrated networks at the lowest possible cost. It is therefore to their advantage to prevent new entrants into the industry. The oil glut and state policy through SNH is forcing both sides to review their contracts and to see how their related objectives of maximizing profits, efficiency and control of the industry can lead to increased production.

## III.4 R&D Activities in the Oil Industry

In Cameroon, research and development activities in the oil industry are very limited. This is partly because all the firms exploring and exploiting petrol are private multinationals. The refinery firm which is national does not yet have a research wing and depends on foreign firms for new technology. This is the case also with the national storage firm. The private multi-nationals have often come to agreements with other firms (also foreign but sometimes national) for R&D support. The human and financial resources engaged in R&D vary depending upon the principal activity of the firm and project scope. In some firms R&D investment is nearly 5% of sales revenue and it is financed from own resources and foreign parent company resources. Firms engaged in production of crude also invest in R&D for exploration and development but investment patterns have changed from exploration research to

development research. These firms play a role in formulating national technological policy in the oil industry, e.g. in the choice of production techniques and in developing local technological capability through implementation of training programmes for manufacturing and maintenance, in some cases also in determining marketing policy.

The oil industry being at a very young stage, research and development aspects have not yet become an important activity. In addition, survey data showed that Cameroon does not have enough qualified and competent personnel to pursue R&D activities. There are only a few university graduates employed in the industry - most of them are professional engineers who are not trained as researchers. The firms do not have any idea about their future requirements for research staff. So far their main preoccupation has been to train Cameroonians to carry on production and maintenance activities. In the area of refining crude also, emphasis is laid on training of nationals to carry on the day-to-day work. For new technology, new products or new production processes, Cameroon is dependent on foreign firms. It is evident that there is a need for firms to support indigenous R&D efforts which might be achieved either through close co-operation with the relevant institute or through developing R&D units within the firms.

## III.5 Oil revenues

In Cameroon the actual figures on oil revenues are shrouded in secrecy, but it is known that oil production itself did not begin to flow in any significant amount before 1980. As in other oil producing countries, the government has had to play a major role in mediating the impact of oil, since it is the redistributor of the revenues. Consumption and investment thus depend on the state budget. In Cameroon, oil revenues accruing to the state are earned from two sources:

(i) the revenues from production sharing, and
(ii) royalties and income taxes that foreign companies pay to the state.

The SNH receives 70% of total oil production and the earnings from this are held in overseas bank accounts, mostly in US banks. Between 1981 and 1985 when the US price per barrel was relatively high

(between 25 and 30 dollars per barrel) these accounts earned very high interests. Since SNH is an autonomous public corporation, none of these revenues enter the government's budget directly, as indicated in the previous chapter. However, when these revenues are repatriated to Cameroon to finance investment expenditures, they enter into the government's account as extra-budgetary items -- Comptes Hors Budget (CHB). Between 1980 and 1985, amounts transferred to the extra-budgetary accounts averaged one-quarter of total government revenues and in 1981 for example, extra-budgetary expenditures were almost twice the actual investment expenditure of the government.[7]

Revenues from royalties and income taxes paid to the government by oil companies are directly "budgetized" and incorporated in the overall government expenditure planning from the very beginning. These revenues have represented about one-quarter of budgetary revenues although the government has been able to ensure that receipts from the oil sector amount to about 87 percent of total net revenues by increasing or decreasing the royalties paid as the case might be.

7. See *Cameroon Country Economic Memorandum*, World Bank Report No. 6395-CM, February 1987, p. 21.

Table III.6 Estimated Government Revenues from Oil

| | 1980 | 1981 | 1982 | 1983 | 1984 | 1985 |
|---|---|---|---|---|---|---|
| Est. production (mil. MT) | 1.9 | 3.4 | 4.7 | 5.8 | 7.0 | 8.4 |
| Estimated price | 207.7 | 297.0 | 261.5 | 238.4 | 221.4 | 208.9 |
| Est. Gross Rev. (Mil $) | 398.4 | 1009.1 | 1228.9 | 1370.6 | 1550.1 | 1754.8 |
| Est. Cost per MT ($)a | 86.0 | 88.1 | 80.8 | 84.6 | 92.1 | 90.9 |
| Est. Total Costs (Mil $) | 163.4 | 282.7 | 379.7 | 486.6 | 644.8 | 763.6 |
| Est. Net Rev. (Mil $) | *235.0* | *726.4* | *849.2* | *884.0* | *905.3* | *991.2* |
| Govt. Net Rev. (Mil $)b | 204.5 | 632.0 | 738.8 | 796.1 | 787.6 | 862.3 |
| Companies Net Rev. (Mil $) | 30.5 | 94.4 | 110.4 | 114.9 | 117.7 | 128.9 |
| Exchange Rate (CFAF/$) | 209.2 | 235.3 | 296.7 | 354.7 | 409.5 | 471.1 |
| Govt. Net Rev. (bill. CFAF) | *42.8* | *148.8* | *219.2* | *272.8* | *322.5* | *406.3* |
| of which: Royalties | (10.6) | (30.5) | (53.5) | (77.7) | (103.0) | (123.0) |
| Company taxes | (5.6) | (7.5) | (24.2) | (27.8) | (34.7) | (45.4) |
| Production-sharing | (26.6) | (110.8) | (141.5) | (167.3) | (184.8) | (237.9) |

a) Production costs include operating costs (estimated at US $ 2.5 per barrel in 1985) and depreciation of investments for exploration and development (about US $ 9.5 per barrel in 1985).

b) Government revenue is assumed to be 87 percent of total net revenue.,

Source: *Cameroon Country Economic Memorandum*, The World Bank, February 1987, p. 21, Table II.

1986 was the peak year for oil production (8.85 million tons), but low revenues (697.2 million $) were earned because of a weak dollar. The government found it difficult to meet its public wage bill estimated to be around 30 billion CFA francs per month and many local commercial banks experienced severe liquidity problems. Oil earnings which totalled around 406.3 billion CFA francs in 1985 were estimated to have plunged by some 60 percent (243.8 billion CFA francs) in 1986 due to the combined effects of falling oil prices and the depreciating dollar.[8] Accumulated net oil revenue to the government between 1980 and 1985 was about $3,994 million and the World Bank estimates that as of 1986, some 86 percent of *all* revenue had been spent, with only 10 percent remaining on deposit in foreign banks and 4 percent in local banks. The report claimed that oil revenue has been used not only for capital investment and the settling of debts but also to fund the increase in the number of civil servants and to subsidize para-statals. It indicated

8. *African Research Bulletin*, Vol. 24, No. 1, February 1987, p. 8568c.

that the economy had already adjusted to the oil money, making "the adjustment to declining oil receipts more difficult than it is generally believed."[9]

## III.6 Impact on employment

The direct impact of the oil sector on employment is known to be small. As noted in Chapter II, the secondary sector of which it forms part, is growing (from 7% of total employment in 1976 to 13% in 1985). Of the 534,000 workers in this sector, the oil industry employs about 0.5%. (This compares with Kuwait 1.3% and Saudi Arabia 2.4% whose oil industries are of course much larger.)

From data collected in the research survey, employment almost doubled between 1980 and 1986, i.e. the oil industry has been expanding at much the same rate as the average for the secondary sector, which for a highly capital intensive industry could be considered as a rapid rate of employment growth.

The indirect impact of the oil industry on employment has certainly been greater than the direct. During the four years 1980-1984, because of the revenue from the CHB account, the private and para-public sectors were able to generate annually about 20,000 new jobs while public sector employment increased by some 8,000 per year (Table III.7).

Table III.7 Employment by sector (in thousands)

| | 1980 | 1984 | 1987 |
|---|---|---|---|
| Private and Parapublic Sector | 282 | 360 | 368 |
| Public Sector | 104 | 135 | 136 |
| Informal Sector | - | 400 | 650 |
| Total Employment outside Agriculture | - | 895 | 1154 |
| Active population in Agriculture | a2591 | b2878 | c3123 |

a 1981
b 1986
c Estimates of 1987

Source: *Cameroon Country Economic Memorandum*, World Bank Report No. 6395 CM, 1987, p. 19, Figures for 1987 are provisional only.

9. *Cameroon Country Economic Memorandum*, op. cit., p. 2.

In particular, revenue from oil enabled the Government to complete projects like the Douala docks, an airport in the north, hydroelectric dams and rural health facilities.

## III.7 Conclusions

To conclude, the most significant macro-economic effects of the oil industry on the Cameroonian economy have been:

First, it was shown that the oil industry value-added is a major component of GDP. Between 1978 and 1985 when the oil boom occurred, oil revenues displaced agricultural revenues, contributing in 1985, 17% of GDP and an estimated 45% of government revenue. Net revenues from oil represented some 35% of total exports of goods and non-factor services.

Second, the existence of substantial oil revenues financed high public spending so that traditional fiscal, balance of payments and inflation constraints did not operate. The oil bonanza permitted a rapid expansion of investment that in turn, induced a rapid growth of non-oil sectors, particularly of manufacturing industry and construction.[10]

Third, the more rapid increase of oil revenues as compared to GDP growth was translated into an unprecedented development of the public sector. Between 1979 and 1981, total oil revenues collected by the government rose from a negligible amount to 148.8 billion CFA or 8.3% of GDP. Over the same period current expenditures of the state rose by 60% while capital expenditure shot up by 310%.[11] Half of the government revenue from oil in 1984 was spent on supporting unviable and uneconomic public sector enterprises whose major effect was the transfer of civil servants from the public service to para-public corporations with high wages.

10. It has been argued elsewhere that the Cameroon economy has "dutch disease" ... the syndrome of rapid structural shifts which tends to favour the non traded sector over the traded sector such as agriculture. See Ngu Joseph N., "The Political Economy of Oil in Cameroon", a paper presented at the *Conference on the Political Economy of Cameroon: Historical Perspectives*, African Studies Center, Leiden, The Netherlands, June 1-4, 1988.

11. *Cameroon Country Economic Memorandum*, op. cit., p. 24.

Finally, apart from generating revenues it should also be noted that the oil industry itself has had a rather minimal impact on the rest of the economy. The oil industry is highly capital intensive, and thus its effect in terms of job generation has remained rather small in Cameroon. The establishment of the oil industry and the building of the refinery depended greatly on foreign capital and technical experts. In all there are less than 3,000 Cameroonians working in the industry and related services. Compared to the amount invested in this industry, this industry is not an important source of employment. Even where oil revenues have been used to support policies of import-substitution industrialization, such as the numerous agro-business enterprises producing for the local market, the incentive framework for manufacturing development has generally tended to favour capital intensive activities and production for the domestic market. These, and the oil industry have few forward and backward linkages in the national economy. Locally produced goods and services do not feature very prominently in the oil industry's basic requirements for highly complex equipment and specialized technical skills, most of which have to be imported. Perhaps more important is the fact that Cameroon has not so far taken advantage of its relatively extensive oil and gas deposits by developing oil-related enterprises such as fertilizers, petrochemicals, and liquified natural gas.[12] However, this is planned to take place in the relatively near future, according to the Draft Master Plan for Industrialisation discussed earlier.

12. Here we note the dismal failure of the fertilizer project SOCAME in 1981. Concerning liquified natural gas, Franlab, a subsidiary of the French Petroleum Institute found in 1981 that Cameroon's non-associated gas reserves were less than 100 cu metres. Thus SEGAZCAM, a joint venture of Elf, Mobil, Shell, Total and SNH suspended the decision on the LNG Kribi project.

Chapter IV

# The educational system's role in producing manpower for the oil industry and the industry's own training system

It is not the intention to describe the educational system as such in this chapter but to briefly review, first of all, possible sources of manpower for the development of the oil industry (secondary technical, polytechnic and higher education in engineering, electronics and the sciences) to ascertain their usefulness and links with the oil sector.

## IV.1 Secondary technical education

Two separate systems exist in Cameroon, an English system for the North and Southwest and a French for the remaining five provinces, both of which provide secondary technical education ("colleges" of four years duration in the French and five in the English). Courses lead to the usual CAP and RSA certificates and later to BACC/Technical Brevet or English equivalent City and Guilds. Technical and vocational secondary education represented only 23.5% of total secondary enrolment in 1983/84. The number of applicants is higher than available places eg. for the "lycees" 2-3 times, indicating that in Cameroon social demand recognises the importance of technical education. In 1983 there were 181 secondary technical institutions (41 public and 140 private), 70.8% of enrolment was in the private sector.[1]

1. Unesco, Etudes sur l'Enseignement et Formation EFI6/13, 1985.

Courses given in these schools are mainly devoted to crafts and commerce but also include mathematics and drawing, general mechanics and electricity, which could form the basis for further training as skilled workers in the oil industry. It can be seen from

Table IV.1 that the Littoral (in close proximity to the site of the oil industry) had by far the highest proportion of secondary technical students compared to the population in 1983, 78% being in private and 22% in government institutions. Thus as far as basic human resources are concerned, supplies in the area are much higher than elsewhere in the country.

Table IV.1 Enrolment in secondary technical education compared to population by province in 1983

| Province | Population Estimated 1000 | Enrolments[1] * Total | of which public | Participation Rate Percentage Total | of which public |
|---|---|---|---|---|---|
| Centre-South | 1 894 | 16 700 | 5 200 | 8.8 | 2.7 |
| East | 493 | 1 500 | 1 100 | 3.4 | 2.5 |
| Littoral | 1 303 | 23 600 | 5 400 | 18.1 | 4.1 |
| North | 2 515 | 1 900 | 1 800 | 0.8 | 0.7 |
| Northwest | 1 089 | 6 500 | 900 | 6.0 | 0.8 |
| West | 1 268 | 7 200 | 2 700 | 5.7 | 2.1 |
| Southwest | 718 | 5 700 | 1 800 | 7.9 | 2.5 |
| Total | 9 226 | 63 100 | 18 900 | 6.8 | 2.0 |

1 = Ibid
* Rounded figures.

Source: Unesco: Cameroun, Etudes sur l'enseignement et la formation, Vol. IV, Enseignement technique et formation professionnelle, Unesco, Paris, 1985.

However the rates for repeaters and dropouts from these schools are high, for example for the technical lycées the drop-out rate was 76.3% (1982/83), and a large proportion of students are over-age, eg. in the lycées techniques 5th-7th year, 55% were 19-21 years and 19% 22-24 years old. Here it is evidently not easy for these schools to produce CAP/BACC etc. students at an age young enough for industry to take them on as low paid trainees. Another criticism is that the programmes are for the most part not linked to industry. However, from discussions

with employers, for those who do obtain technical certificates, work is rapidly found in the industrial sector and the labour market is far from being saturated for such students.

## IV.2 Higher education

The University of Yaoundé (founded in 1973) and four university centres at Douala, Dschang, Ngaoundere and Buea are the responsibility of the Ministry of Higher Education and Scientific Research (MESRES) while seven other ministries run schools of professional training in such areas as administration, social affairs, public works, sport, etc. Higher education is structured on the French system.

As regards overall output of scientific and technical graduates, it was found[2] that during the VIth Five Year Plan, the overall supply of university level graduates exceeded labour market demand but that there was a disequilibrium of too few trained in Science and Technology and too many in Letters, Law and Social Sciences. It was in particular the lack of mathematics and science teachers at secondary level which contributed to the vicious circle of under-supply.

Most students (76%) attend the University of Yaoundé (See Table IV.2).

Table IV.2 Total Enrolments in Higher Education (1983/84)

| Institutions | Enrolments | Percentage |
|---|---|---|
| University of Yaoundé | 11 764 | 75.59 |
| University Centre Douala | 814 | 5.23 |
| University Centre Dschang | 872 | 5.60 |
| University Centre Ngaoundéré | 237 | 1.52 |
| Other Schools | 1 876 | 12.06 |
| Total | 15 563 | 100.00 |

Source: Ibid., Vol. VI.

2. Sack, R. and Stuman, E. "University Level Manpower Supply and Demand in Cameroon - Status and Prospects", 30 January 1985, Unesco mimeo.

The Faculty of Science at Yaoundé constituted 25% of total enrolment while the polytechnic (under the Ministry of Public Works) constituted just 2%. The Faculty is increasing its output of graduates while those from the Polytechnic (ENSP) show a drop (Table IV.3). However, according to studies carried out[3] the latter type of institutions are favoured as regards resources (number of students are small, entry is by competition, the quality of instruction is higher, they have better student/teacher ratios and equipment - unit costs are much higher eg. ENSP unit costs were 1901,700 FCFA while the Faculty of Science unit costs were 454,800 FCFA).

Table IV.3 Evolution of output of graduates

| | 1980/81 | 1983/84 |
|---|---|---|
| Faculty of Science | | |
| 1st Degree | 112 | 189 |
| M.Sc. | 50 | 48 |
| Dr. | - | 6 |
| Polytechnic ENSP | | |
| Engineers | 66 | 56 |

Source: Ibid.

Graduates from the Polytechnic find work very quickly; among their employers is the oil industry.

As to the Science 1st degree graduates, on average each takes a year longer than foreseen in the programme to obtain a degree. The Faculty suffers from lack of facilities and only four sessions of practical work can be given instead of the 15 programmed. This situation has increased the number of repeaters and drop-outs (49% repeated the first year in 1982/83 and there was a 25% drop out). An effort is being made to improve the level of scientific and technical subjects by cooperation agreements with universities in France.

3. Sack, R. and Stuman, E., ibid.

As to the employment of the graduates from this faculty, it is admitted that there is a risk of unemployment since enrolment in the various fields is not oriented to manpower needs and there are not enough links with the modern economic sector.

It will have been noted that unlike other African oil producers (Nigeria and Algeria), neither the university nor any of the schools has a department or option for petroleum studies. To meet this gap in provision, as far back as the early 1970s, the Government has offered scholarships for study overseas. Many of these graduates would have been suitable for recruitment into the oil industry (Table IV.4).

Table IV.4 Cameroonian students studying overseas

| | 1983/84 | 1985/86 |
|---|---|---|
| Petrochemistry | 24 | 14 |
| Electronics | 12 | 49 |
| Computer Science | 49 | 110 |
| Mechanics | 18 | 53 |
| Physics | 7 | 28 |

Source: Sack, R. and Stuman, E., Ibid.

It would thus appear that as far as petroleum studies are concerned, a great deal of reliance has been placed on study abroad for high level manpower. It would also seem that lack of practical sessions of local graduates would cause some problems in their transfer to the world of work. This will be examined in a later chapter, as well as the type of supplementary training which it was necessary to give to local recruits.

## IV.3 Non-formal education

There is also a system of vocational training under the Ministry of Labour (CENAFOP - National Centre of Vocational Training) to train and recycle manpower for industry. At present its activities are limited to giving courses at the demand of employers. From the 1983 and 1984 figures on output of trainees,[4] CENAFOP had not so far been involved with the oil industry but did, for example, train five mechanics and four industrial electronics employees for other firms. The majority of its training seems to be in the field of car repairs. However, many of the large firms in Cameroon have their own training programmes (railways, Renault, shoe and cigarette companies) while the Ministries of Agriculture and Post and Telecommunications also have their own schools. In line with this general policy in the country, the oil industry has set up its own training system, a report on which is presented below.

## IV.4 The oil industry's own training system

The first training of oil personnel in Cameroon was conducted by ELF-Cameroon which opened a centre in Douala in 1977. To begin with, the training was mainly in the fields of Safety, Fire-fighting and Prevention, first aid and general safety in process operations. Gradually specialised courses in equipment use and maintenance were initiated in process control, instrumentation, pumps and compressors, etc. Its activities declined when the refinery training centre was set up. SONARA, Cameroon refining company began its training courses in 1981 and is now the major centre for producing oil personnel. Before describing its activities, a brief overview of training in the industry as a whole will be given, as indicated by the response to the questionnaire survey.

Eighty-eight per cent of the firms organised further training: 75% had both in-service programmes and sent staff to parent companies abroad, 50% sent staff to other firms in Cameroon, 38% to academic institutions abroad and 25% to institutions in Cameroon. One firm had used a training course organised by CENAFOP.

4. Ibid

Disregarding SONARA, by actual number of staff trained, producers of crude had given the most and the highest level of training, using nearly all types of training opportunity available (Table IV.5). However, it is evident that most training is given by the company's own centre followed by local training centre. R&D training was only conducted in a foreign university. The largest number of staff trained were in the skilled worker category followed by engineers and sales staff. Management select such staff for training according to 1) needs expressed by the department concerned, and 2) on the job performance. Most firms supported the cost of training, paying for the course, travel, daily allowance and board and lodging. Even in cases where staff followed a course independently, the firm gave some financial support.

Table IV.5 Staff trained during 1980-86 by type of firm and training Institution

| | Producers of Crude | | | | | |
|---|---|---|---|---|---|---|
| | R&D | Eng. | Admin. | Sales | Tech. | Clerical |
| Foreign university | 4 | 5 | 2 | - | - | - |
| Foreign firms | - | 7 | 1 | - | - | - |
| Local training centres | - | 24 | 2 | - | - | - |
| Company's own centre | - | 9 | 26 | 20 | 60 | 20 |
| Local university | - | 1 | 1 | - | - | - |
| Training centre abroad | - | 1 | - | - | - | - |
| Total: | 4 | 47 | 32 | 20 | 60 | 20 |
| | Distributors | | | | | |
| Foreign university | 1 | - | - | - | - | - |
| Foreign firms | - | 1 | - | 6 | - | - |
| Local training centres | - | 3 | 6 | 13 | 38 | 10 |
| Company's own centre | - | 13 | - | 10 | 7 | 11 |
| Local university | - | - | - | - | | - |
| Training centre abroad | - | - | - | - | - | - |
| Total: | 1 | 17 | 6 | 29 | 45 | 21 |

Half the firms provided literature to keep staff abreast of the latest developments in the oil industry. Teaching staff for in-service training are mainly obtained from abroad - the parent company or a cooperating foreign firm. The training materials are usually adapted by local staff from materials used in the parent company.

It may be concluded that overall the oil industry has been very efficient in providing for the training of its own manpower, particularly producers of crude. However the main training effort in Cameroon has been conducted by SONARA, Cameroon refining company, whose policies, logistics, organisation etc. are described in the following section.

## IV.5 Training in SONARA

Before the refinery started operations, it was necessary to train a nucleus of Cameroonian engineers and technicians capable of running the refinery with the assistance of technical partners. Training was done in foreign refineries in 1978-80, mainly in France. But in 1981 training began in Cameroon. The growth in numbers trained is shown in Table IV.6, most being in the skilled worker category (operation, maintenance, safety).

During the period 1981-83, training objectives aimed mainly at giving newly trained operators complementary knowledge to keep units running (start-up, shut-down, regeneration of catalysts). In addition, another group was recruited and trained locally - hence a high volume of training was carried out in this period.

Table IV.6 SONARA training statistics during pre-start-up period 1978-81

| No. Group | 1978/1979(a) No. of Persons | 1978/1979(a) Volume (Man-Days) | 1979/1980(a) No. of Persons | 1979/1980(a) Volume (Man-Days) | 1980/1981(b) No. of Persons | 1980/1981(b) Volume (Man-Days) |
|---|---|---|---|---|---|---|
| 1 Operators | 42 | 9 240 | 42 | 9 240 | 68 | 14 960 |
| 2 Maintenance | - | - | 9 | 1 980 | 17 | 3 740 |
| 3 Inspection | 1 | 220 | 2 | 440 | 62 | 440 |
| 4 Process/ Programme | - | - | 2 | 440 | 2 | 440 |
| 5 Safety | 1 | 220 | 1 | 220 | 19 | 4 180 |
| 6 Laboratory | - | - | 1 | 220 | 10 | 2 200 |
| 7 Technical Senior Staff | 4 | 880 | 7 | 1 540 | 7 | 1 540 |
| 8 Administrative Senior Staff | 1 | 90 | 1 | 90 | 1 | 110 |
| Total | 49 | 10 650 | 65 | 14 170 | 126 | 27 610 |

(a) Most training done in France.
(b) Mostly on-the-job training in Cameroon.

During 1983-86, when the refinery was running smoothly, training had to respond to needs expressed at the time. Operators had to be recycled in order to sharpen their response to possible problems after a long period of trouble-free operations. Maintenance teams had to be given more training as equipment was aging and becoming more susceptible to break-downs. Senior staff, such as engineers and foremen, were to be initiated into management techniques. Choice of trainees and training was guided by consideration of the potential of the trainee, attributes of the post and the Cameroonisation programme. Most programmes were organised locally, i.e. seminars for management training and on-the-job for technical workers.

In the future, technical innovations (butane recovery system, bitumen plant, road-loading facilities, etc.) will dictate the training provided.

Table IV.7 SONARA Training Statistics 1984-89 (in Man-Days)

| General Staff | 1984/85 | 1985/86 | 1986/87 | 1987/88 | 1988/89* |
|---|---|---|---|---|---|
| Basic training | 617 | 450 | 450 | 1 080 | 1 055 |
| Economics | 171 | 60 | 50 | 39 | 10 |
| Administration | 91 | 50 | 20 | 92 | 60 |
| Management | 270 | 150 | 150 | 209 | 240 |
| Law | 29 | 40 | 40 | - | 30 |
| Safety | 499 | 400 | 400 | 782 | 926 |
| Technical: | | | | | |
| Refinery | 572 | 380 | 150 | 191 | 220 |
| Movement | 118 | 80 | 40 | 96 | 180 |
| Mechanics | 381 | 250 | 120 | 211 | 360 |
| Boiler-making | 269 | 200 | 150 | 170 | 150 |
| Electricity | 139 | 220 | 150 | 84 | 185 |
| Instrumentation | 150 | 100 | 100 | 18 | 90 |
| Computers | 99 | 150 | 150 | 125 | - |
| Other | 71 | 80 | 80 | 215 | 620 |
| Clerical | 176 | 150 | 150 | - | 32 |
| Sub-total | 3 652 | 2 760 | 2 160 | 3 312 | 4 158 |
| G2P (DEX) | 800 | 800 | 800 | 800 | 980 |
| Foreign non-professional | 700 | 800 | 800 | 1 440 | 1 560 |
| Total General Staff | 5 152 | 4 360 | 3 760 | 5 552 | 6 698 |
| Professional | | | | | |
| Cameroon Staff | 836 | 300 | 200 | 115 | 140 |
| Foreign Professional | 1 300 | 1 300 | 1 100 | 1 110 | 1 655 |
| Total Professional | 2 136 | 1 600 | 1 300 | 1 225 | 1 795 |
| Overall Total | 7 288 | 5 960 | 5 060 | 6 777 | 8 493 |

* Foreseen.

However, apart from this immediate and practical training, SONARA has an over-riding training policy motivated by the desire to secure independence on the one hand and profitability on the other, i.e. total technological transfer. Consequently a policy of Cameroonisation was adopted whereby training would be planned so that Cameroonians would progressively take up posts with higher and higher responsibilities. With this particular aim in view a training department has been set up with its own manager, a deputy and three sectors

administration, logistics, teaching staff and printshop. The training department has its own budget which it manages. It recommends those training activities which can be handled in-company and those which must be sought outside, it programmes leave and provides a channel of information between the different actors.

In particular, the Department:

- summons trainees and teaching staff according to the approved programme;
- analyses and comments on the results of training programmes for other departments and general management;
- writes monthly and annual training reports;
- compiles statistics.

Since training materials have continually to be updated, the logistics staff and printshop have to cope with a large volume of documents, including:

- typing and reproducing courses or modifying existing ones, making and up-dating training process flow-sheets, preparation of pedagogic aids (drawings and diagrams, tables, samples of products or equipment, cross-section of scrapped equipment, slides, films and transparencies);
- binding of materials, especially training manuals;
- rudimentary library service.

Quarterly meetings are organised to discuss training activities during which past programmes are evaluated and modifications agreed upon. The quarterly meeting held in November/December is reserved for estimation of training needs in the following year and establishment of the annual budget.

A balance has to be struck concerning the type of activity which the training centre can carry out, those to be carried out on the job and what types of external training will be needed. Up to the present time the centre has adopted the role of providing training in the field of operations up to the level of "Intervention Operator". Such training represents about 4000 man hours annually and is equivalent to 55% of total training.

As regards on-the-job training, senior staff select those who will act as instructors to trainees, and the instructor is taught how to divide complex tasks into elementary phases and often has written step-by-step guidelines.

Some staff are sent to external seminars not only to acquire technical knowledge but to establish contacts in the outside world. It is hoped that they will thereby broaden their outlook and propose useful innovations when they return. SONARA has favoured external specialised organisations to carry out "intramural" seminars furnishing the organiser with all the relevant raw materials and information needed.

As regards training abroad, SONARA takes advice from a foreign company in Paris as to the appropriate course for a desired level of training and resources available. Such training is usually done in other refineries in developed or developing countries or in the specialised training centres of other oil companies. This type of training is costly but SONARA cannot at present handle needs for high level manpower.

For Cameroonisation of managerial posts, young school leavers are recruited and are expected to work up from the lowest post to one of responsibility, undertaking training needed on the way.

Training is evaluated at all the different levels, by the trainee, instructor, training department, management and by the cooperating company in Paris. Departments evaluate impact of training on job performance after a minimum time lapse of six months.

As far as an overall evaluation of the SONARA training system is concerned, the company has tangible and indisputable evidence of the success of its system, eg.

1. A good nucleus of Cameroonians (over 60) was recruited in 1978/79 and sent for training of varying lengths. In 1981 they were back in Cameroon and assisted by a skeleton team of expatriates carried out the commissioning of the refinery, one of the most successful in the history of refining.
2. SONARA personnel, mostly Cameroonian, have learned to programme and execute shut-down, maintenance and start-up operations in the minimum time.
3. The ever-increasing volume of safety training has yielded good results, ranked among the best when compared to all European and African refineries.

4. Between 1981 and 1988 a total of 27 high level posts have been Cameroonised and a further 26 such posts will be filled by Cameroonians by 1992. The financial benefits of this for SONARA are great since there is a big cost differential between local employees and expatriates. With well-defined roles, frankness, impartiality and transparency, the Cameroonisation programme has enhanced the atmosphere of confidence between local staff and technical assistance agencies.
5. Management seminars, initiated only as from 1983, have greatly improved management practice in regard to delegation, motivation, time-keeping, an improved social climate, working to objectives. Where many other parastatals are subsidised, SONARA is fending for herself and making profits. The different departments have a high degree of profit consciousness, better budgeting procedures and control.

## IV.6 Conclusions

The formal educational system has difficulties in producing enough scientific and technical graduates to satisfy the demands of industry in Cameroon. Technical and vocational secondary education represented only 23.5% of total secondary enrolment in 1983/84 and the Science Faculty plus Polytechnic 27% of enrolment in higher education. Both levels suffer from the problems of a high rate of repeaters, drop-outs, the provision of practical work and links with industry. However, the Littoral, site of the oil industry, has by far the highest percentage of secondary technical students per population and thus supplies in the region should be higher than for industry elsewhere.

The policy adopted for the provision of manpower to this industry has in fact been the same as for other specialised industries in Cameroon. A widespread system of non-formal education in the various companies has been established, using a variety of modes of training in-country and abroad. The company's own centre is primarily favoured followed by use of a local training centre. The latter is that of Cameroonian SONARA refinery which now does most of the training of skilled workers -- it cannot as yet handle needs for high level technical manpower but has an in-company scheme for the training of managers.

Under this method, good results have been achieved as regards smooth operation, safety, Cameroonisation and management efficiency. It has made an external impact by training personnel for other firms and by giving practical work opportunities to students.

However, few R&D workers have so far been trained for Cameroon. These are costly and usually have to be sent abroad for long-term studies and experience. The Government has helped by offering scholarships for high level petrol studies abroad. If budgetary limitations would permit it, which has so far not been the case, SONARA acknowledges that it would be advisable to broaden the scope of its activities to include R&D and higher level student training. It might enquire as to the possibilities of cooperation in R&D training with the in-country multinational producers of crude, since the latter have recently themselves trained such personnel abroad, who would now be able to form nuclei of trained researcher plus M.Sc. or Ph.D. trainees.

Chapter V

# Manpower in the oil industry, its recruitment, salary structure and career development as perceived by the employers and employees

## Introduction

We have already seen in Chapters II and III that the secondary sector has grown from 7% of the working population in 1976 to 13% in 1985 (534,000 workers). Of these, the oil industry employs about 3000 (0.5%). In the oil firms taking part in the survey, employment almost doubled between 1980 and 1986 but the most rapid increase took place mainly in the firms producing crude (a tripling of employees). Refinery employees grew only by a third, though, as in 1980, it remained the largest employer in the group. Distribution and storage firms, being small (approximately 160 employees) and well established in 1980, needed little more in the way of staff.

In Cameroon, most highly skilled jobs are held by expatriates, especially in companies financed by foreign capital. In the group of oil firms surveyed, the proportion of expatriates remained much the same during 1980-86 at 9-10%, with the multinational producers of crude having higher proportions (15-19%), Cameroonian refinery 9% and the distributors a low 2-5%, conforming to the skill levels required in the firms. As regards the structure of qualifications in the firms, few of them could give precise data for 1980. However from the information

available the firms have increased the proportion of employees having BAC or higher qualifications by 6 to 10% - the proportion having less than BAC ranging from 65 to 35% depending on the type of firm. The refinery, with its planned system of training, greatly increased its numbers of local M.Sc. Engineers (from two to 16) and technicians with BAC (45 to 95) during the period.

One multinational producer of crude reported a shortage of experienced engineers and of computer operators, so that there is scope for further employment of local people if Cameroon could provide them. But as we have noted in Chapter IV, it is just this type of staff that the local formal and non-formal education systems have difficulties in producing.

This chapter aims at examining how the firms have managed to build up their stock of manpower and how the sample of employees have developed over the six year period. In this respect, it should be recalled (see Chapter I) that the sample of employees was, for the purposes of the research, biassed towards the formally educated in the oil industry - 11% of them were junior secondary leavers, 18% senior secondary, 30% technical college graduates and 34% had a higher degree - only 7% had no formal educational qualification. 47% of them worked in production, 21% in maintenance and 13% in sales.

## V.1 Recruitment of employees in the oil industry

### *A. Views of the Firms*

The majority of firms stated that they only definitively recruited staff after initial training -- this would concern for the most part lower level workers. About half the firms had visited educational institutions (for technicians) and a quarter advertised in newspapers, used an employment agency (for computer programmers) or relied on personal applications.

The criteria used for selection of staff were most importantly in the case of Engineers: academic performance, professional training and Cameroon nationality, followed by educational institution, past work experience and foreign training. For technicians, important criteria were type of educational institution, professional training, past work experience and Cameroon nationality. The main criterion for selection

of a skilled worker was professional training. The emphasis on Cameroonian nationality at the higher levels conforms with Government policy: this criterion was equally important for the multinationals.

The principal method used to examine recruits was an interview followed by written test.

To sum up, for high level staff, it is education, training and Cameroonian nationality which count whereas skilled workers must above all prove their aptitudes during in-service training.

## *B. Views of the Employees*

Here the recruitment process is analysed according to three important aspects, namely: (i) how the potential employees came to know about job vacancies; (ii) what were the methods of recruitment used; and (iii) what according to employees were the most important criteria in their being selected for the job.

Table V.1 shows how the employees came to know about a job vacancy. It is evident that though employers may visit schools and advertise in papers, such open channels of job information do not result in actual recruitment/acceptance for initial training. By far the greatest proportion (46%) came to know about a job vacancy through friends and acquaintances. It has often been claimed that the job market in Cameroon works through an informal network -- our study would seem to bear this out.

Table V.1 Job information sources as perceived by employees

| Method | Percentage |
|---|---|
| Within firm job advertisement | 4.8 |
| Within firm after in-service training | 7.5 |
| Newspaper advertisements | 8.6 |
| Advertisements in educational institutes | 2.2 |
| Employment agency | 5.4 |
| Friends and acquaintances | 45.7 |
| Other | 25.8 |

The employees confirmed the employers' response regarding interview and written test as principal methods of recruitment. They were also asked to evaluate the recruitment criteria they felt had been applied as very important (2), important (1) or not important (0). Under this system "past work experience" received the highest ranking at 1.3. However, second at 1.24 was "performance in professional training" confirming the employers' statement that staff are only recruited after training. Employees feel that their own personal characteristics were more important (rank 1.23) than "past academic performance" at 1.14 which again emphasises ability to perform on the job.

Table V.2 shows that recommendations, either personal from the government or from a foreign firm count for little. However, type of school, Cameroonian nationality and language competence are of some importance (ranked approximately 1.00).

Table V.2 Recruitment criteria as perceived by employees (213)

| | | Ranking |
|---|---|---|
| 1. | Past work experience | 1.30 |
| 2. | Performance in professional training | 1.24 |
| 3. | Attitudes/personal characteristics | 1.23 |
| 4. | Past academic performance | 1.14 |
| 5. | Type of school attended | 1.01 |
| 6. | Cameroonian nationality | 1.00 |
| 7. | Language competence | 0.91 |
| 8. | Training abroad | 0.56 |
| 9. | Other criteria | 0.27 |
| 10. | Personal recommendation | 0.25 |
| 11. | Recommendation from government | 0.11 |
| 12. | Recommendation from foreign firms | 0.10 |

It may be concluded that the recruitment procedures of the oil firms are eminently practical in nature. Despite the fact that employees learnt of job vacancies through friends and acquaintances and that they represented the educated elite of the oil industry, they had to be able to learn and perform on the job. This conforms with the oil industry's own policy of in-service training and producing the manpower it needs for itself.

## V.2 Career development in the oil industry

In line with their policy on recruitment, promotion in the oil industry is given according to performance on the job for all levels of staff (ranked as very important) followed by in-service training (ranked as important (1)). Seniority is ranked only 0.7.

As to the rewards and incentives offered by the salary structure in the oil industry, salaries as a whole compare favourably with the average earnings of Cameroonian skilled workers and hence the industry should not lack for applicants or workers willing to make their careers in oil (see Table V.3).

Table V.3 Salary levels of average Cameroon skilled workers and those in the oil industry in 1986

| Category | | Average wage (in 000 CFA) | Oil Industry (in 000 CFA) | |
|---|---|---|---|---|
| 04 | Skilled | 48 | | |
| 06 | Workers | 74 | Skilled production worker | 78 - 170 |
| 08 | Foremen | 140 | Clerical | 65 - 200 |
| 09 | Technicians | 171 | Technician | 130 - 330 |
| 10 | | 236 | | |
| 11 | Professionals | 300 | Engineer | 360 - 590 |
| 12 | | 451 | Manager | 370 - 700 |

Source: Sixth Five Year Plan 1986-91
MIN PAT/ILO 1987

The survey data showed that distribution firms offered higher salaries to their managers and engineers than did the other firms but it must be noted that these firms are small concerns, and the high level staff would be few and in charge of the whole operation.

## A. Career development of the employees

To understand how the manpower of the industry has developed it was necessary to obtain data mainly from the employees about their origins, education, in-service training and career development.

### Socio-economic origins of employees

An analysis of the occupations and education of the fathers of the employees showed a relatively high percentage of professionals (24%) but 59% had been unskilled or agricultural workers. 24% had had no education at all, 48% only primary, 23% secondary and just 5% had attained higher education. The level of education of their children (the employees) was much higher: 36% had obtained some kind of higher education and 21% secondary. However, analysis revealed no significant correlation between the two groups as regards level of education. The results of a similar analysis of cross tabulation of employees' education with parents' income were much the same, i.e. parents' income did not explain level of education. The oil industry, as a new sector, may be particularly attractive to first generation educated and those who have to make their way independently (Table V.4).

Table V.4 Level of education of employees in oil industry compared to fathers

| | Education | | | | | |
|---|---|---|---|---|---|---|
| Employee | Without education | Primary | Secondary | Higher | Other | Total |
| Up to 13 years | 12.5 | 18.2 | 8.1 | 1.2 | 2.5 | 42.5 (68) |
| 14 to 16 years | 4.4 | 8.1 | 6.3 | 1.8 | 0.7 | 21.3 (34) |
| 17 to 21 years | 6.4 | 12.5 | 5.6 | 1.2 | 1.2 | 26.9 (43) |
| More than 21 | 0.6 | 4.4 | 9.2 | 0.6 | 0.6 | 9.4 (15) |
| Total (Number) | 23.8 (38) | 43.1 (69) | 23.1 (37) | 5.0 (8) | 5.0 (8) | 100.0(160) |

Analysing employees' level of education according to source of finance shows that private resources predominate (55%) followed by government (25%) (see Table V.5), and this is true for all levels of education. Private resources constituted temporary employment of the

individuals concerned. In an examination of data on employment while studying, half of those who had achieved higher secondary had worked while studying, and 37% had worked to achieve higher education (see Table V.6).

Table V.5 Education level of employees according to source of finance

| | Source of finance | | | | |
|---|---|---|---|---|---|
| Education level of Employees | Private | Employers | Govt. or Univ. | Other | Total |
| Up to 13 years | 17.3 | 0.8 | 1.6 | 4.0 | 24.0 (28) |
| 14 to 16 years | 16.5 | 1.6 | 11.3 | 1.6 | 31.0 (36) |
| 17 years and more | 21.0 | 4.6 | 12.3 | 7.1 | 45.0 (51) |
| Total (Number) | 54.8 (63) | 7.0 (8) | 25.2 (29) | 13.0 (15) | 100.0 (115) |

Table V.6 Employment while studying according to level of education achieved

| | Level of education | | | | |
|---|---|---|---|---|---|
| | 13 years or less | 14 to 16 years | 17 to 21 years | 21 years plus | Total |
| Yes | 3.7 | 10.4 | 12.3 | 1.8 | 28.2(46) |
| No | 37.7 | 10.6 | 16.1 | 7.5 | 71.8(116) |
| Total (Number) | 41.4 (67) | 21.0 (34) | 28.4 (46) | 9.3 (15) | 100.0(162) |

The same situation exists for those employees having obtained a diploma or degree abroad (Table V.7). One may note once again the predominance of private resources and government grants and the small participation (11%) of employers in financing formal education.

Table V.7 Employees with diplomas/degrees obtained abroad according to source of finance

| Diplomas/Degrees | Source of Finance | | | | |
|---|---|---|---|---|---|
| | Private | Employers | Govt. or Univ. | Other | Total |
| BTS, DUEG, DESG and First Degree | 9.2 | - | 7.4 | 2.0 | 18.6 (10) |
| M.Sc., Eng. Dipl. | 24.0 | 3.7 | 3.8 | 7.4 | 38.9 (21) |
| Ph.D. | 5.5 | 2.0 | 11.1 | 5.5 | 24.1 (13) |
| Other | 5.5 | 5.5 | 3.8 | 3.7 | 18.5 (10) |
| Total (Number) | 44.4 (24) | 11.1 (6) | 25.9 (14) | 18.5 (10) | 100.0 (54) |

One may conclude that the employees for the most part came from modest origins (as regards parents' education and income) and that the completion of their studies was financed mainly from private resources (50%) and secondly from government grants (25%). Employers and other agencies play a minor role in assisting students to complete formal education, and when they do, it is at M.Sc. or Ph.D. level.

We have seen in the first part of this chapter that employees heard about job possibilities through friends but that their actual recruitment depended on their successful completion of in-service training while promotion depended on their job performance. The next section concerns the extent of in-service training and further education undertaken by this group of employees to fit them for their jobs.

## *B. In-service training and further education of employees*

Table V.8 shows that few employees of the producers of crude and in the refinery did not receive in-service training whereas more than half those in distribution firms had not received training: evidently this is a function of the skill needs.

Table V.8 In-service training received by employees according to type of firm

| Training | Activity: Producers of Crude | Refinery | Distribution and Stocking | Other | Total |
|---|---|---|---|---|---|
| Yes | 11.8 | 26.4 | 18.5 | 5.0 | 57.2 (101) |
| No | 5.6 | 5.6 | 21.9 | 5.1 | 42.8 (79) |
| Total (Number) | 17.4 (31) | 32.0 (57) | 40.4 (72) | 10.1 (18) | 100.0 (178) |

Analysing data by level of education attained, it is evident that by quantity, most of the training had been given to employees with lower levels of education (two thirds of them) but that even at the higher levels more than half had also been given in-service training (Table V.9).

Table V.9 In-service training according to level of education of employees

| In-service training | Level of education: or less | 13 years | 14 to 16 years | 17 to 21 plus | 21 years Total |
|---|---|---|---|---|---|
| Yes | 27.8 | 12.4 | 18.9 | 5.9 | 65.0(109) |
| No | 14.2 | 9.5 | 8.3 | 3.0 | 35.0 (59) |
| Total (Number) | 42.0 (71) | 21.9 (37) | 27.2 (46) | 8.9 (15) | 100.0(169) |

Forty per cent of the employees had participated in seminars organised in the firms, a slightly higher proportion in distributor firms (44%) than in the refinery (42%) or in producers of crude (37%). The seminars were destined rather more for those with higher education (79%) than for senior secondary or secondary (56% and 46% respectively) thus taking the place of in-service training; it was noted earlier that less of the highly educated had received the longer term training.

In addition, the oil companies have sent quite large proportions of their employees on mission abroad - 41% in the case of distributors, 23% for the refinery and 18% for producers of crude - these were also for higher level staff.

It may be concluded that after having made great efforts themselves to achieve formal education, the oil company employees have subsequently benefitted from substantial amounts of training, the type received, in-service, seminars, missions - differing by skill level.

The period under study being short and the oil industry a young one, the time has mainly been taken up with fitting the employees for their jobs. Table V.10 shows that there have been only minor changes in the positions of this group of employees - a few having moved up into professional or technician positions over the 5-6 year period. At the beginning of the period, 41% classed themselves as professional, 26% as technicians, 16% as skilled workers and 17% as "other". These proportions subsequently became 45:28:12:15 respectively.

However, the employees had experienced substantial increases in their salaries. Whereas when first employed 68% received less than 200,000 CFA per month, in 1988 this proportion had fallen to 35%. Similarly those receiving 300,000+ CFA when first employed constituted only 18% of the group, while in 1988 they formed 45%. The highest proportions receiving 300,000+ CFA are of course those with higher education (89%) falling to 56% for senior secondary and to 16% for secondary or less. These compare to 42%, 28% and 0 when first employed (see Table V.11).

Table V.10 Starting and present positions of employees by level of education

| Position | Level of education: 13 years or less Starting | 13 years or less Present | 14 - 16 years Starting | 14 - 16 years Present | 17 - 21 years Starting | 17 - 21 years Present | 21 + years Starting | 21 + years Present | Total Starting | Total Present |
|---|---|---|---|---|---|---|---|---|---|---|
| | % | % | % | % | % | % | % | % | % | % |
| Professional | 20 | 26 | 55 | 57 | 68 | 73 | 25 | 17 | 41 | 45 |
| Technician | 38 | 44 | 26 | 18 | 10 | 4.5 | 17 | 50 | 26 | 28 |
| Skilled Worker | 20 | 15 | - | - | 12 | 9 | 50 | 33 | 16 | 12 |
| Other | 21 | 15 | 19 | 25 | 10 | 13.5 | 8 | - | 17 | 15 |
| Total | 100 (66) | 100 (68) | 100 (31) | 100 (28) | 100 (41) | 100 (44) | 100 (12) | 100 (12) | 100 (150) | 100 (150) |

Table V.11 Monthly salaries of employees in first and present employment by level of education

| Salary in CFA | Level of education: 13 years or less First | 13 years or less Present | 14 - 16 years First | 14 - 16 years Present | 17 - 21 years First | 17 - 21 years Present | 21 + years First | 21 + years Present | Total (No.) First | Total (No.) Present |
|---|---|---|---|---|---|---|---|---|---|---|
| | % | % | % | % | % | % | % | % | % | % |
| Less than 200,000 | 41.0 | 27.3 | 14.8 | 0.6 | 6.5 | 1.2 | 5.9 | 5.5 | 68.2 (93) | 34.6 (52) |
| 200,000 - 300,000 | 2.1 | 11.3 | 2.1 | 6.0 | 8.6 | 1.3 | 0.7 | 1.4 | 13.5 (18) | 20.0 (30) |
| 300,000 + | - | 7.4 | 6.5 | 14.7 | 11.2 | 20.8 | 0.7 | 2.4 | 18.2 (26) | 45.3 (68) |
| Total | 43.1 (59) | 46.0 (69) | 23.4 (32) | 21.3 (32) | 26.3 (36) | 23.3 (35) | 7.3 (10) | 9.3 (14) | 100.0 (137) | 100.0 (150) |

## V.3 Conclusions

The oil industry, though employing relatively few workers, doubled its number of employees over the period 1980-86 (the rate of increase for producers of crude was particularly rapid). As new technology firms, they required to employ on average 10% expatriate staff for high level jobs - a proportion which remained constant over the period. The firms somewhat increased the formal educational qualification structure of their employees over the period; Cameroonian refinery in particular, which greatly increased its numbers of local engineers and technicians with BAC etc.

However, the oil sector in Cameroon, as for most specialised new technology industries in developing countries, has to train its staff itself. A good intake of applicants is ensured by a favourable salary structure and in fact it seems that by word of mouth or reputation, they have no difficulty in attracting young people, a large percentage of whom had already shown initiative and energy by working to obtain secondary or higher education.

The oil firms are eminently practical in their approach to recruitment and promotion: performance in in-service training and on the job are what count, though for higher level staff (engineers and technicians) academic performance, educational institution and Cameroonian nationality were also important criteria, i.e. employers were actually seeking to recruit local staff.

The employees confirmed the statement of the oil firms: work and professional training were the most important criteria for recruitment. But they also added, as almost equally important to these, their own personal characteristics, i.e. they had to be of a type who could learn and perform on the job. It was therefore not surprising to learn that the majority (60%) were the first generation in modern sector employment and many of them had achieved their secondary (50%) or higher education (37%) by taking temporary employment.

It was noted that employers were only a small source of financing (11%) of formal education. Perhaps this is so because employers have to undertake the costs of training their own manpower - in the oil sector no formal institution teaches basic petroleum studies. The refinery and producers of crude had to make massive efforts to train their staff (only 17% of the refinery employees reported that they had

had no training). This rose to 32% for the producers of crude but reached 54% for the distributors. Evidently the latter, employing many salesmen, require less in the way of skill training.

Longer in-service training was given to lower level staff, while for higher level engineers and professional, the extent was reduced but supplemented by seminars and visits abroad. A small number of the employees had already improved their positions, moving up to the professional or technician grade but the main improvements for the group as a whole were in respect to their salaries: 45% of the group had attained a relatively high salary of 300,000+ CFA as compared to 18% when they first began work six years ago.

It may be concluded that the oil industry has reacted positively and practically to the manpower situation in Cameroon, undertaking at considerable cost the training of local staff for the industry. In turn Cameroonian employees have shown themselves to be able to learn, adapt and profit from opportunities given. However, how difficult this has been and whether the formal education sector could contribute more to producing manpower for the oil sector, will be examined in the next chapter.

Chapter VI

# Government-education-industry relationships in the oil sector

Today, cooperation among government agencies, the educational system and industry is thought to be vital for technological development. Several factors are behind this change in attitude, although universities usually still have some reservations, thinking that all-out cooperation may cost them their autonomy. First, the system of higher education cannot keep pace with the speed of technological development in industry. Second, limitations of financial resources are obliging academic institutions to look for new resources, and finally there is a growing awareness of the unsuitability of academic courses for the needs of industry. As regards the firms, the questionnaire survey was designed to:

1. identify the major forms and mechanisms of cooperation among the three sectors;
2. show the present status of such cooperation in the field of research, training and employment;
3. identify major problems and barriers to cooperation among government, industry and academic institutions; and
4. suggest measures to improve upon cooperation.

## VI.1 The views of the firms

The distributor firms had little to say on this matter, not requiring many high level staff. However the producers of crude mentioned that they maintained contact with the educational system by giving scholarships to Cameroonians for university studies in Yaoundé and abroad. One had established a foundation for this purpose. Also links were maintained by the organisation of seminars. Government-oil industry relationships were channelled through the National Hydrocarbon Corporation (SNH).

The Cameroonian refinery is much more active in respect to cooperation. As the training centre responsible for all national training of refinery workers, it offers to those possessing a "CAP" seven year training to prepare them as "agents de maitrise" and two years training to Engineers to prepare them for professional posts. However it was considered that there was a general weakness in technical education in the country which slowed down the indigenization programmes of the refinery. In addition a rigidity in the French qualification structure resulted in an "agent de maitrise" not being allowed promotion to a professional grade. Thus ambitious young people tended to leave to continue their studies outside and the refinery was losing useful staff.

The refinery has an impact on the outside community by training the personnel of other companies (especially in the field of safety). It also accepts ten students each year for whom industrial training is a degree requirement and has been invited to act as a member of the jury when theses are defended. In addition, 130 students on average are given holiday jobs each year to afford them all-important practical experience.

There was of course no cooperation in the field of R&D, this being absent in the higher educational system.

Of the five firms who responded regarding the quality of education in the country, four were satisfied with that given by technical colleges and the university. However opinion was divided as to the quality of primary and secondary, two considering it to be adequate, two not and one considering it only as "middling".

The Cameroonian refinery considers that results have so far been encouraging with its present local training centre, though it acknowledges that the staffing of the centre is insufficient. It would like in the future to be able to use more expatriate oil personnel who are in

the last few years of their employment in the Cameroon as teaching staff. In this respect, one of the producers of crude mentioned that it would like to exchange staff and there seems to be a possibility for more cooperation here.

The refinery also considers that activities should be broadened in scope, allowing for cooperation with formal educational institutions in research projects and industrial training assignments. A producer of crude would also like to offer consultant contracts to university personnel. It thus seems that the higher educational system should examine how it might establish a mechanism for this purpose.

The long term aim of the Cameroonian refinery's training centre is to provide a reserve of highly trained and experienced Cameroonians who could take up posts elsewhere and offer teaching services as required. However, given the present declining production of crude and some uncertainty as to further developments in the fields of gas and fertilisers etc., the opinion was that it did not seem feasible to envisage the imminent creation of a specialised petroleum training and research institute.

But this did not mean that the oil industry, educational system and SNH should continue to wait before taking action on cooperation. The refinery and producers of crude are willing to assist the educational system in devising an option on basic petroleum studies in formal educational programmes and as stated above, are ready to consider such cooperative activities as exchange of staff, project evaluation, consultancies, etc.

## VI.2 The views of the employees

The questionnaire survey of employees concentrated on establishing the suitability of the formal education system as a basis for employment in the modern sector, what problems were faced in adaptation to their jobs, what forms of training were most useful to supplement formal education and how the education system might better serve the development of technological personnel.

It is generally considered that the formal educational system is primarily useful in teaching how to learn and acquire skills, and how to behave in a large bureaucratic organisation in addition to the acquisition of a stock of basic knowledge and skills. The majority of the oil industry employees (83%) felt that their formal education had been useful to them

in their employment - the 17% who replied in the negative are those with lower levels of education, thus confirming some oil firms' views that primary and secondary education were not adequate.

Table VI.1 indicates the problems of employees in adapting to industry. We have already seen from Chapter IV that opportunities for practical work are lacking in the education system. The employees' criticisms show this to be the case in that they felt their formal education to have been too theoretical (51%), giving no information on industry (40%) or allowing for creativity (24%).

Table VI.1 Classification of problems faced with regard to formal education when adjusting to jobs

| | Problem | Percentage |
|---|---|---|
| 1. | Teaching was mostly theoretical and bookish | 50.6 |
| 2. | Instruction did not acquaint students with industry | 40.2 |
| 3. | No emphasis on creativity of students | 24.3 |
| 4. | Educational contents out of date | 16.8 |
| 5. | Other | 9.2 |

Several points should be made here. If the workers' formal education experience is to be constructive, they need orientation to and skill preparation (at least at the high school level) for the world of work. But the educational system in Cameroon has not been able to provide this kind of learning environment because of the high costs of vocational education and the difficulties of developing effective work-study programmes. Only the national refinery (SONARA) has such a programme but few students know about it in regions other than the Littoral. The failure of many secondary schools and the university of Yaoundé to provide their students with specific occupational skills helps to explain why a relatively large proportion of workers at technical and professional levels had gone abroad to acquire further training.

In the opinion of the employees, the most useful forms of training needed to supplement their formal education were company in-service training both in the Cameroon and abroad (43% and 23% respectively),

i.e. the practical work, which is lacking at secondary and higher education level. It therefore follows that few of them thought university courses were useful (Table VI.2).

Table VI.2 Types of training considered most useful to supplement formal education as perceived by employees

| | Types of Training | Percentage |
|---|---|---|
| 1. | Company Inservice Training | 43.3 |
| 2. | Company training abroad | 23.0 |
| 3. | Training in another country abroad | 18.0 |
| 4. | Training in another company in Cameroon | 15.5 |
| 5. | Correspondence courses | 9.3 |
| 6. | Other | 8.6 |
| 7. | Short term courses in R&D institute abroad | 3.3 |
| 8. | Short term courses in university abroad | 3.3 |
| 9. | Short term courses in university of Yaoundé | 3.3 |
| 10. | Short term courses in R&D institute in Yaoundé | 0.8 |

Finally, workers were asked to give their ideas as to how they think the country's higher education institutions, particularly those responsible for training workers used by the oil industry, can be of better service to the country in producing high technology personnel to meet the challenge of technological self-reliance. The results were somewhat surprising in that the majority (69%) of the employees thought the answer lay in developing university-government-industry relationships and research (56%) while a lesser proportion were concerned with changing methods of instruction (38%), and introducing new subjects (34%) (Table VI.3).

Table VI.3 How higher education might be of better service to the oil industry in the opinion of the employees

| | | Percentage |
|---|---|---|
| 1. | Development of University/Government/Industry relationships | 69.4 |
| 2. | Development of Research | 55.6 |
| 3. | Change in methods of instruction | 38.3 |
| 4. | Development of new subjects | 34.1 |
| 5. | Restructuring of educational system | 27.0 |
| 6. | Revision of content of overall educational programme | 21.4 |

It is evident that employees feel if the three parties could cooperate, then the necessary changes and improvements would follow. Though few of them are involved in R&D, they recognised the importance of active R&D work for the improvement of educational programmes and the quality of graduates.

## VI.3. Conclusions

The multinational firms' links with education were limited to providing scholarships for university studies and the organisation of seminars, while their links with government were limited to the National Hydrocarbon Corporation. It might be felt by the Cameroonians that this was all a foreign firm would be willing to undertake, but in fact interest was expressed by multinationals in exchange of staff, in project execution, and in consultancies for university personnel. It seems that if a cooperative mechanism existed, it might be possible to develop relationships and further involve the multinationals in student training, etc. as done by the Cameroonian refinery training centre. An additional area of cooperation is that suggested by the training centre i.e. they would like to profit from the presence of expatriates who have worked for some years in the Cameroon and use them, say, during the last year of their sojourn in the Cameroon as teaching staff. These people would prove invaluable as they have the most extensive knowledge of the industry and of the situation in the Cameroon, as well as being accustomed to the local people.

A major problem in establishing cooperation with higher education is the absence of a petroleum studies option and R&D activities. The refinery feels that it is not necessary immediately to establish a specialised institute but that the university, by developing such an option, would gain the cooperation of the oil industry. These links could be further expanded to the building up of an indigenous R&D capability.

While the majority of the employees were of the opinion that their formal education had been useful, nevertheless they felt the lack of practical work. The problems encountered in secondary technical education and higher education in the sciences are well known. Though some of the firms stated that they were not satisfied with the quality of primary and secondary education, so far only the refinery offers work

study programmes. Firms could improve the level of possible applicants for jobs by also cooperating in work study programmes with the nearest secondary technical schools and by sponsoring certain studies whereby they would provide some equipment, computers, etc.

The employees considered that the establishment of government-education-industry cooperation was the most important element if higher education was to be of better service to the oil industry. Here SNH and the refinery could take the initiative by organising a high level meeting, inviting participants from the multinationals, secondary and higher education, and any other government agencies felt necessary to consider an agenda which might include the following:

1. Appropriate mechanism to establish government-education-oil industry relationships;
2. The programme of work for such a cooperation mechanism, e.g.
   - a petroleum studies option in higher education;
   - improvement of relevant secondary technical and higher education;
   - cooperation of oil industry in work study programmes and sponsorship of studies in secondary technical schools;
   - provision of experienced expatriates as teaching staff;
   - the best means to develop R&D activities in the Cameroon.

Chapter VII

# Principal findings and implications for the educational and training system

## Introduction

In Chapter I, we stated that the objective of this research was to analyse the influence of the development of the oil industry in Cameroon on the expansion, structure and content of the country's formal and non-formal education and training system. The study, in the process, attempted to analyse (i) the industrial and technological policies of the oil industry, (ii) the impact of these policies on the economy and employment structure of the workforce, (iii) the impact of these developments on the training and educational needs, and finally the objective was to derive implications of these developments for planning of education and training in the country so as to meet the needs of the oil industry.

We shall discuss the results of the analysis and their implications for educational planning below.

## VII.1 The economic framework of the country and the evolution of technological policies

Cameroon, in common with all developing countries, has experienced the vicissitudes of a young nation state after independence. The country began on a high note with a development strategy of planned liberalism, self-reliance, balanced development and social

justice. At that time, most of the private enterprises were owned and operated by foreign nationals so that the appropriate role for the state was seen as creating a favourable infrastructure and public utilities while encouraging Cameroonians to develop the private sector. In the 1960s, Cameroon benefitted from a favourable world economic climate and had a surplus to invest. It continued to attract foreign capital but at the same time encouraged private initiatives by an investment code and a protected domestic market.

A trough in the country's fortunes occurred in the 1970s; public enterprises were less profitable, private investment stagnated, world terms of trade turned against primary products. In response, the Government changed its industrial policy in the early 1970s to reduce reliance on foreign investment and gave even more encouragement to national initiatives for economic development, but this had to be financed out of treasury reserves. This still failed to generate sufficient employment and train enough local manpower. Thus the late 1970s was a period of deficit financing, increasing unemployment and a general slowing down of the economy.

At that time, oil came on stream, the revenue from which permitted expansion of manufacturing (in particular aluminium and fertilisers) and construction. Assistance was given to small and medium enterprises while diversification and dispersal of industry was encouraged by preferential treatment. By the mid-1980s, Cameroon had made some progress towards industrialisation; traditional agricultural exports had fallen to 58% of the total while industrial product export had risen to 20%. The urban population increased to 40% of the whole.

Thus exploitation of oil was a turning point in the economic development of Cameroon: it provided the resources to give impetus to a stagnating economy. However at the same time certain reserves were put aside to try to avert the onset of "Dutch disease", i.e. usually when oil revenues are spent domestically, the real exchange rate appreciates leading to a shift in the production mix to non-tradables. In Cameroon, this occurred in the aggregate but some tradable sectors expanded, in particular the import-substituting industries underwent an increase in demand. However, efforts to protect tradable sectors with tariffs had little effect on reversing the structural change induced by oil revenues.[1]

1. Benjamin, N. and Devarajan, S., "Oil Revenues and Economic Policy in Cameroon", World Bank Staff Working Paper No. 745, August 1985.

Revenue was spent not only on investment and settling of debts but also on increasing the number of civil servants and para-statals, which made it very difficult to adjust to the decline in oil receipts which occurred in 1986 due to falling oil prices and the depreciating dollar.

The most recent Five Year Plan (the Sixth: 1986-91) attempts to develop a Master Plan for Industrialisation to serve as a framework for encouraging the private sector and continue the process of Cameroonisation. The Plan considers oil as one of the strategic industries and includes extension of the refinery, exploitation of natural gas and manufacture of raw materials for plastics by the year 2000.

In respect of the evolution of the technological policies of the oil industry the following findings were noteworthy.

Given the extent of foreign capital and manpower in the industry and mining sector in Cameroon, development policies from the first took into account the need to continue reliance on foreign expertise while encouraging Cameroonisation. As time passed, the role of the state in regulating foreign intervention increased, but while the policy of self-reliant development was successful in the agricultural sector, this was not generally the case in industry. Thus the Third Plan (1970s) created technical and financial structures to assist local small and medium enterprises and only then did the share of foreign investment start to decline.

Efforts to plan technological development are recent. After several false starts since independence, in establishing national research organisations the National Committee for the Transfer of Technology (CNTT) was set up in 1978. It has wide and challenging responsibilities, including cataloging national needs in the realms of science, technology and industry; studying modalities for the transfer, adaptation and use of technology and selecting foreign technology that would contribute efficiently to Cameroon's development. However, even Cameroon National Union (CNU) Congress held at Bafoussam in 1980, which was dubbed as the "Congress of the Mastery of our Development" made no reference to the urgency of developing an institute to cater for technological development. The government did register its resolve in the Fifth Five-Year Development Plan to set up a Technological and Industrial Research Institute, but this is still awaited.

On the education and training side, very general official statements have been made concerning the provision of technical education (see Fifth and Sixth Plans) and attempts by the Ministry of Plan and Regional Development to compile an inventory of national technical skills as well as various scattered international efforts to study university-level manpower supply and demand in Cameroon have met with little success (Sack et al., ibid., 1986).

The oil industry was of little significance until 1980 but by that time the state had clearly defined policies for the exploitation of its natural resources i.e. a strict system of licensing under which the state received the majority share of output, the proportion increasing as production increased. In addition, it took the refining and petrochemical industries under its control. However, exploration and production of crude were left mainly in the hands of the multinationals. The problem here was the uncertainty concerning the existence of viable reserves. Sources of crude may be exhausted by 1994 or on the other hand, new reserves may be found. The same uncertainty surrounds gas reserves.

Thus technological policy was concentrated on the practical aspects of setting up and training enough manpower for the production and maintenance activities of the refinery. The time scale (1980-86) is still so short that policy-making has not been brought to bear on R&D for new production processes or new products etc. Thus this report will appear at a time when it can make a contribution to the discussions and plans of CNTT over the next few years.

This is important since the country's new "Master Plan for Industrialisation" is now being finalised, the oil industry being included as one of the strategic industries whose development is mapped out up to the year 2000 together with manpower needs. The plan still assumes a strong dependence on foreign technology and no mention is made of projects to include the oil sector in the R&D and teaching programmes of higher education.

The above findings allow us to draw certain implications for policy in the area of technological development in the oil industry within the broad framework of the economic development strategy of the country.

These are as follows:

(1) The tax conditions governing oil exploration which are currently less favourable to the exploring companies should be revised so as to motivate these companies to invest in exploring new resources, by adopting new and sophisticated technology, if necessary.

(2) The combined effect of the decreases in oil volume and prices will reduce Cameroon's gross domestic income. This calls for serious attention to be given to the "Master Plan for Industrialisation". This strategy in addition to emphasizing diversification of industrial investment also recommends diversification of investment in the oil industry by exploration of natural gas, investment in the petrochemical industry and expansion of the oil refinery.

(3) The country should give more attention to the development of local technological capability not only for the oil industry but as an overall development strategy. This would call for more effective co-operation with foreign companies to start with under a national policy for transfer of technology. This would also call for an institutional infrastructure for research and development. There is an urgent need for setting up the Technological and Industrial Research Institute which was proposed in the last five-year plan but has not yet been set up.

(4) The foreign firms should be considered as a rich resource for development and should be encouraged to help the country expand its industrial infrastructure. A framework of co-operation should be developed between them and the country which will benefit both sides in the long run. Their active participation should be sought throughout all the stages of the development strategy -- from formulating the policy to implementation of programmes. This co-operation will call for sophisticated negotiating skill on the part of Cameroonians which will ultimately have to be imparted by the education and training system and will be discussed later.

(5) Keeping in view the "Master Plan of Industrialisation", of which oil is an important item, attention should be given to amassing data on the stock and flow of highly qualified manpower. No analytical human resource development study has yet been undertaken by the country. This is an essential step for successful implementation of any development strategy.

## VII.2 The impact of the oil industry on the economy and employment

Oil was found off-shore in viable quantities in the south west region only, though exploration is still going on in the north. Production was estimated to have doubled between 1982 and 1984, reached its peak in 1985 at 8.85 million tons and then fell to 8.28 million tons in 1987. Known reserves will be exhausted in the early 1990s unless further sites are found. However, there are extensive gas deposits in the Littoral region.

The state refinery, which began operations in 1981 can now satisfy the needs of the country for light petroleum products.

The impact of oil on Cameroon's export earnings was rapidly felt: from 1.4% in 1977/78 oil exports rose to 67.8% in 1983/84 falling back slightly to 65.4% in 1985/86.

The direct impact of the oil sector on employment has been small -- about 3000 jobs (0.5% of secondary sector employment) in 1986. However these jobs are highly significant for the country's technological development since practically all of them -- foreign and national enterprises alike -- entail a major and costly training investment and the employees are amongst the skilled élite of the country.

Indirectly, it was estimated that due to oil revenues, 20,000 new jobs have been generated annually in the private and para-public sectors in addition to 8000 per year in the public sector. Such employment was created by major construction projects like docks, airports and dams as well as by the creation of a network of rural health clinics. If the draft Master Plan for Industrialisation is approved and implemented the country's demand for high level manpower in the oil and related industries will increase. According to one estimate, the extension of the refinery will need 550 skilled staff including 80 engineers, the natural gas complex will need 400 staff (60 p.c. professional), excluding 211 man months of expatriate staff, the complex to transform natural gas into ammonia/urea and methanol will need 736 staff excluding 26 expatriates and the plastic factory will need 117 national professionals and technicians and four expatriates by the year 2000.

Implications of the above findings for planning are as follows:

(1) The declining role of the oil industry in the economy and on employment creation calls for the decision-makers to diversify the economic activities of the country and to look for new reserves. For this qualified human resources are essential. Education and training needs to be geared to develop such manpower so as to explore the natural resources of the country, to exploit them for economic well being and to distribute and manage them. The education and training system should be able to impart the relevant skills and be production oriented and employment related.

(2) For the country to implement the Master Plan for Industrialisation and have the oil industry play its role properly it is necessary to train the required manpower envisaged in the plan. This would call for:

(i) Joint action by the government, industry and the education sector in developing the content, structure and method of instruction.

(ii) Establishment of co-operation on national terms with foreign firms, so that the activities of exploration and exploitation and distribution of the oil and related resources can be carried on smoothly.

## VII.3 The education and training system for the oil industry

The oil industry selects its skilled and professional employees from secondary technical schools, the polytechnic and the university science faculties. Most secondary schools in the country are private and their growth much influenced by strong social demand. This is particularly true for the technical streams, 70.8% of which were private (1983) receiving 2-3 applications for each place. The Littoral region, which has the highest proportion of secondary and technical pupils, is in close proximity to the site of the refinery and other oil sector industries so that one may conclude that the possibility of a job in the modern sector has provided a strong stimulus to the growth of private education in Cameroon.

The oil industry, in common with other large modern sector enterprises, accepts that the educational system could not, for the most part, provide the various specialists required since they need rigorous

practical training. Such practical training is not generally available either at secondary or at higher education levels. In effect, the formal education system as in most African countries has major problems in producing young people with technical certificates. The low output from secondary schools is caused by lack of maths and science teachers and the absence of equipment and facilities for practical work. The higher education system too produces too few Science and Technology graduates and also experiences problems in giving enough practical training. The Polytechnic, an élite establishment as regards resources, comprises only 2% of the total student body. It is from the latter that the oil industry seeks to recruit its high level technical manpower, in addition to itself funding higher education students both in Cameroon and abroad.

Despite the difficulties noted above, the formal educational system has been able to respond to needs to some extent since the proportions of employees holding formal educational qualifications of BAC and above increased by 6-10% in the enterprise sample during 1980-86. Nevertheless there are still shortages of experienced engineers, computer operators and R&D staff.

Though the oil industry has adopted the policy that it must arrange for the training of its own manpower itself, the fact that there is no school, department nor option on petroleum studies, has meant that the education system and the industry have few opportunities for direct contact on a regular basis, whereby curricula, practical work, R&D etc. might be discussed.

The system of training devised by the oil industry -- mainly the enterprises' own centres plus the local refinery training centre is impressive. It is flexible in that according to skills needed, in addition to local training centres, staff are sent to other firms in Cameroon and abroad, and to academic institutions in-country and abroad. The latter opportunities are fewer and are aimed at high level staff. The main training effort is concentrated on the skilled worker category (operations and maintenance). Financial support is generous, covering all aspects of travel, daily allowance, board and lodging etc.

The largest local oil industry training centre is that of the refinery, which was set up in 1981 and does both long (career planning) and short term training, i.e. it gives for example a 7-year course for an "agent de maitrise", trains up management staff through all the different departments over a long period, and gives short courses, particularly on

safety which are attended by staff of other firms. The greatest training effort had to be made in 1980/81 to train operators, followed by maintenance and safety training, but five other kinds of personnel were trained from laboratory to senior technical staff and inspectors. However, by 1984 the training needs had become much more complex: 16 types of training were given including for instance computers, law, boiler-making, management. The centre expects an even wider range of training responsibilities as the refinery is extended, gas exploited etc. The refinery has obtained satisfactory results with its training centre: it has produced efficient skilled workers as needed and filled a considerable number of high level posts with Cameroonians. However, this has been a costly process since such staff still have to be given training abroad. This local training centre is of the opinion that the time has come to widen the scope of its activities to include R&D and higher level training but it does not have the resources to do so.

The sample of employees confirmed the wide extent of training activities organised in the industry -- 68% of employees of producers of crude had received in-service training, and 82% of those in the refinery. However, a lesser proportion 46% of employees in distribution and stocking had been trained in-company. Most of the in-service training is given to skilled workers (67%) but even at higher levels more than half had also received some training but here it was more likely to have been seminars or missions abroad.

The firms were above all practical in their search for and recruitment of staff: skilled level workers were only definitively recruited after training and half the firms visited educational institutions for the recruitment of technicians. Only a quarter used newspaper advertisements or employment agencies and this was for specialised staff like computer operators. Actual recruitment for higher level staff depended on academic performance, and again professional training, plus Cameroon nationality in line with the policy guidelines set down by the Government.

The employees largely confirmed the statements of the enterprises but in one respect surprisingly differed in that by far the greatest proportion came to know about a job possibility in the oil industry through friends and acquaintances -- only 2% mentioned information in educational institutions. Responses to the questionnaire on criteria used

all stressed the ability to learn and perform on the job, for which they are well rewarded in comparison to average salary levels in Cameroon. The salaries of the employees showed rapid increases over a 5-6 year period.

From an analysis of the socio-economic origins of the employees and sources of finance for education it was evident that the oil industry attracts first generation educated and those who have to make their own way by working during formal education. Employers contributed little to formal education (11% of the sample) and when they do it is at M.Sc. or Ph.D. level. However, when asked if they were satisfied with the output from the formal education system, it was the primary and secondary education levels which received some criticism, i.e. basic maths and technical subjects.

The survey showed that the major forms of co-operation among the three sectors remained bilateral i.e. industry-government and industry-education. Industry-government relations are confined to policy for the exploitation and development of oil, and mainly licensing arrangements.

Industry-education relations are for the most part very limited: the granting of fellowships at higher education level and the meeting of staff in seminars from time to time. The exception to this is Cameroonian refinery which accepts both higher education and secondary technical students for practical training.

The following implications could be derived for education and training in the country from the above findings:

(i) Cameroon should emphasize basic science and mathematics in its secondary schools, at present the level is unsatisfactory according to our survey of employers and employees of the oil industry;

(ii) The performance of secondary technical schools has to be improved by (a) linking them more closely to industries, (b) making courses more work related; (c) recruiting qualified teaching staff, especially in mathematics and science, with a national incentive system; (d) transferring, if possible, part of the training to the industries;

(iii) The University of Yaoundé should, again in co-operation with the industry and government, strengthen its scientific and technical branches. To start with the university and its branches could open short cycle diploma programmes in technology. This might be done at the university at a cheaper cost than done at the polytechnic at present.

(iv) The result of limited bilateral relationships among the three sectors (government, industry, education) has meant that policy making for the oil sector and for education does not consider changes which might be desirable in the education system as the industry develops. It is evident that the general weakness in technical and professional education can only be overcome in the long term but that does not preclude certain short term measures being taken. For example, as mentioned before, some of the multinationals expressed dissatisfaction with the quality of primary and secondary education but they have up to the present had no direct channels of communication to express precisely what they require, nor has the educational system at these lower levels been able to benefit from co-operation as has been the case for the refinery i.e. acceptance of students for practical work. The oil enterprises might begin a school "sponsorship" programme in their locality with talks by oil personnel on the industry, provision of films, equipment, etc.

Another aspect that could be dealt with by a mechanism of tripartite co-operation is the qualification structure resulting from the French type educational system which is now being found to be too rigid. Valued workers are obliged to leave in order to obtain further qualifications before they can enter the ranks of the professionals. Recognition of on-the-job training and work as part of higher education in petroleum studies would allow more highly qualified staff to be trained. It would keep them in the enterprises and provide more motivation to all staff to undertake higher education.

Here it should be mentioned that in Korea a governmental agency (Korea Technical Qualifications Testing Agency) was set up in 1976 to standardise the various tests of knowledge and skills gained in industry. It registers the successful examinees as holders of specific diplomas for employment in certain posts. A similar agency in Cameroon would serve not only the oil industry but the whole of the industrial sector.

In sum, while oil sector training is flexible and practical, the educational system is not and could surely benefit from contacts to bring in new ideas, content, methods etc., even if only first of all in limited areas. Success would thereafter filter into other departments.

While it is true that the oil sector conducts its own training according to its own needs, it is a fact that a considerable amount of expensive training is given and large numbers of modern sector manpower are produced by them. The multinationals, while foreign and

private, should be considered as a rich resource for development of *both* the country and manpower and as such, should be treated as participants in deliberations on educational planning at all levels.

(v) In order to help develop local technological capability, the country should take advantage of the infrastructure of SONARA as well as its willingness to start work on research and development in the oil industry. In this area also tripartite co-operation among the university, government and industry is essential.

The above suggestions, we hope will provide the decision-makers of the country with some hints for formulating educational and training policies for the development of the country's key economic activity -- the oil industry.

# Annex I

## Development of the oil industry in Cameroon and its implications for educational planning

## Oil Industry Employees' Questionnaire

I. *Personal characteristics*

1. Name_____

2. Name of firm_____

3. Age (in years)_____

4. Sex_____

5. Marital status: 1) married ___2) single _____
   3) widow(er) 4) divorced _____

6. Province of origin:1) Centre ___ 2) South _____
   3) East___ 4) North _____
   5) Adamawa_____ 6) Far North _____
   7) West_____ 8) Littoral _____
   9) South West ___10) North West _____

II. *Family Characteristics*

7. a) Father's or guardian's education:1) primary ___
2)secondary_____ 3) higher ___ 4) none ___
5) other (specify) _____

7. b) While a student, your father's occupation was:
1) professional and above ___ 2) production and related ___
3) services (sales, etc.) worker ___ 4) skilled worker ___
5) Unskilled worker ___ 6) agriculture ___ 7) other (specify)
Mother's occupation: 1) professional and above ___
2) production and related ___
3) services (sales, etc.) worker ___ 4) skilled worker ___
5) unskilled worker ___
6) agriculture ___ 7) other (specify) _____

7. c) Approximate parental (or guardian's) income per month while you were a student:
1) less than 25,000 FCFA ___
2) between 25,000 FCFA and 50,000 FCFA ___
3) between 50,000 FCFA and 100,000 FCFA ___
4) between 100,000 FCFA and 200,000 FCFA ___
5) between 200,000 FCFA and 300,000 FCFA ___
6) above 300,000 FCFA ___

III. *Educational career*

8. Please indicate the level and type of educational institution you attended as well as the level of academic qualification obtained.

| Level of education | Academic qualification obtained and grade |
|---|---|
| Junior Secondary | |
| Senior Secondary | |
| Technical College | |
| University (Bachelor level) | |
| University (Masters) | |
| University (Ph.D. Doctorat) | |
| Others (please specify) | |

9. Did you attend universities abroad? 1) Yes ___ 2) No ___. If yes, please state the degree obtained and name the university and the country. Degree ___ Universities _____

10. What was your field of study?
    1) at undergraduate level _____
    2) at graduate level _____

11. Who financed your highest level of formal education?
    1) private (from own sources) ___ 2) bonded by employer ___
    3) government scholarships ___ 4) scholarship provided by enterprises ___ 5) university (institutional) scholarships ___
    6) other sources (specify) _____

IV. *Professional training*

12. Have you undertaken any professional training courses independently? Yes ___ No ___
    If yes, please indicate type and duration (in years/months)

13. Have you attended any in-company training? Yes ___ No ___
    If yes, which of the following types and for what duration?

| Type | Duration in years + months |
|---|---|
| Company's own training centre | |
| Another company's training centre in Cameroon | |
| Own company's training centre abroad | |
| Another company's training centre abroad (mention countries) | |
| Short term courses in the university in Yaoundé | |
| Short term courses in a university abroad (mention countries) | |
| Short term courses in R&D institutes in Cameroon | |
| Short term courses in R&D institutes abroad | |
| Any other training (specify) | |

14. Have you attended any seminars, workshops or conferences?
Yes ___ No ___

If Yes, please give type, duration and location.

| Type | Duration (in days) | Location |
|---|---|---|

15 How many overseas visits did you make in 1986 exclusively for professional reasons?

| Countries visited | Duration of visit (in days) |
|---|---|

V. *Employment Career*

16. Did you work during formal study? 1) Yes ___ No ___
If yes, at what levels of your study?
1) B.Sc (licence) ___ 2) M.Sc (Doct. 3è cycle) ___
3) Ph.D (Doct. d'Etat) ___ 4) Other (specify) _____

17. a) What was the first firm you were employed in after obtaining your highest degree?
Name _____ Country _____
b) When was it: 19 ___
c) What was your function? 1) R&D ___ 2) Teaching ___
3) Design ___ 4) Production ___ 5) Maintenance ___
6) Sales ___ 7) Others (specify) _____
d) What was your position? 1) Professional ___ 2) Technician ___
3) Skilled worker ___ 4) other (specify) _____
e) What was your approximate salary per month? _____. FC

18. a) When did you join the present company/institution? 19 ___
b) What was your function? 1) R&D ___ 2) Teaching ___
3) Design ___ 4) Production ___ 5) Maintenance ___
6) Sales ___ 7) other (specify) _____
c) At what position did you start working in this firm?
1) professional ___ 2) technician ___3) skilled worker ___
4) other (specify) _____

19. a) What is your present function? 1) R&D ___ 2) teaching ___
3) design ___ 4) production ___ 5) maintenance ___
6) sales ___ 7) other (specify) _____
b) What is your present position in the firm? 1) professional ___
2) technician ___ 3) skilled worker ___
4) other (specify) _____
c) How many years have you been working in your present position? _____ years.
d) What is your salary per month? _____ FCFA

20. a) How many firms/institutions have you worked for since you took up first employment? ___
b) What were the reasons for changing firms? Please tick the appropriate items: 1) better economic incentives ___
2) better career prospects ___ 3) better utilization of training ___
4) better working conditions ___ 5) lost job ___
6) greater responsibility ___
7) other (specify) _____

21. a) How many changes in jobs have you made since you joined the present firm? _____
b) What were the reasons? 1) due to change in the product ___
2) due to change in production process (including automation) ___
3) improved competence with advanced professional training ___
4) regular promotion ___ 5) other (specify) _____

22. Have you ever been unemployed? Yes ___ No ___
If Yes, please state duration (in months) _____
and indicate reasons:
Few opportunities in labour market
Education not of a sufficiently high level
Training inadequate
Other (please specify)

23. How were you informed of the vacancy of the post you now hold?
Within firm posting of job vacancies
Within firm and after completion of in-service training course___
Posting of job vacancy in educational institution
Newspaper advertisement
Employment agency
Through friends or acquaintances
Other (please specify)

24. What recruitment method was used when you were selected for your present post?
Written test
Interview
Other (please specify)

25. In your experience, what criteria were utilised in your selection for the post? (Please rank Very Important = 3; Important = 2; No importance = 0)

| Criteria | Rank |
|---|---|
| Type of educational institution attended | |
| Academic performance | |
| Professional training performance | |
| Past work experience | |
| Personal recommendation | |
| Foreign training/experience | |
| Language competence (bilingual English/French) | |
| Cameroon nationality | |
| Attitudes/personal characteristics | |
| Secondment from foreign company | |
| Secondment from Government | |
| Other (please specify) | |

## VI. *Education - Employment Relationship*

26. a) Was the formal education you received useful in performing the tasks in your first employment after graduation? 1) Yes ___ 2) No
(Please rank Very useful = 2; Useful = 1)
b) Which types of training were the most useful in helping you supplement formal education? (Please rank Most useful = 2; Useful = 1; Not useful = 0)
Company in-service training
Training in another company in Cameroon
Company training abroad
Training in another company abroad (mention country)
Short term courses in University, Yaoundé
Short term courses in University abroad (mention countries)___
Short term courses in R&D institute in Cameroon
Short term courses in R&D institute abroad (mention country)___
Correspondence courses
Other (please specify)
c) Were you given incentives to undertake further training?
Yes ___ No ___
If Yes, what were the incentives?
More interesting work
Prospect of promotion
Increase in salary
Visits abroad
Other (please specify)

27. What problems did you face as regards your formal education when adjusting to your job?
Educational contents were out of date
Teaching was mostly theoretical and bookish
Instruction did not acquaint students with industry
No emphasis on creativity of students
Other (specify)

28. Please give your ideas as to how you think the country's higher education institutions, particularly those responsible for training workers used by the oil industry, can be of better service to the country in providing high technology personnel to meet the challenge of technological self-reliance. Emphasis should be placed on:
    1) New subjects which should be developed
    2) Content of overall educational programme
    3) Methods of instruction
    4) Structure of the educational system
    5) Research orientation
    6) University/Government/Industry relationships

Many thanks for your cooperation.

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**Research Report No. 79**

In what way has technological development in the oil industry evolved in Cameroon within the broad framework of the development strategy of the country? How did development in the industry affect the employment and qualification structure of its workforce? How did the education and training system of the country respond to the development needs of the oil industry? What implications for policy in general and educational policy in particular could be drawn from the responses of the above questions? The present study attempts to respond to these questions based on a survey of 213 employees and eight enterprises, supplemented by an additional analysis of available published and unpublished documents.

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